



DG TAXUD

# Address Processing Guidance

## ICS2

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# 1 INTRODUCTION

## 1.1 Purpose

This document describes rules for processing postal addresses in order to correctly submit ENS Fillings to the ICS2. Generally, the address details should be collected in a right format and structure from the source, however, not all economic operators are able to do so from the start of the ICS2 Release 1. For the transitional period of ICS2 in Release 1, it is allowed to submit postal address that is parsed by automated means when collecting of normalized address at source is not possible. In that case, the rules for submission as described in this document need to be followed.

## 1.2 Scope

This document covers ICS2 rules for postal addresses handling and features non-exhaustive list of examples for guidance.

## 1.3 Target Audience

The intended audience for this document are the representatives of the Member States, Economic Operators, any person involved in ICS2 project.

## 1.4 Structure of this document

The present document contains the following chapters:

- Chapter 1 – Introduction: describes the scope and the objectives of the document;
- Chapter 2 – Postal Address definition: describes basic attributes of ICS2 address structure
- Chapter 3 – Mapping postal Address: describes how to map common postal elements for ICS2 structure
- Chapter 4 – Recommended parsing tools: describes recommended tools for automated address parsing

## 1.5 Reference and applicable documents

### 1.5.1 Reference Documents

Ref.	Title	Reference	Version	Date
R01	ICS2 Definitions		1.10	15/10/2018
R02	ICS2 Information Exchange Specifications		1.15	08/01/2020
R03	ICS2 HTI Rules and Conditions		1.10	15/10/2018
R04	ICS2 HTI Code Lists		1.13	29/11/2019

*Table 1: Reference documents*

## 1.6 Abbreviations and Acronyms

Abbreviation/Acronym	Definition
CR	Common Repository
ENS	Entry Summary Declaration
EU	European Union
HTI	Harmonised Trader Interface
ICS2	Import Control System 2
IE	Information exchange
MS	Member State
NES	National Entry System

*Table 2: Abbreviations and acronyms*

## 2 POSTAL ADDRESS AS DEFINED IN ICS2 ENS FILLING

Following address format is used for ICS2 messages to submit ENS Filling.

Element Name	Format	Mandatory?	WCO Name	WCO ID
City	AN..35	Yes	City name	241
Country	A2	Yes	Country, coded	242
Sub-division	AN..35	No	Country sub-entity name	243
Street name line 1	AN..70	Yes, unless PO BOX used	Street name	519
Postcode	AN..17	Only if country uses it for all addresses	Postcode identification	245
Street name line 2	AN..70	No	Street name	519
Number	AN..35	Yes, unless PO BOX used	House number	520
P.O. Box	AN..70	Yes, unless Number used	P. O. Box	522

*Table 3: Address format for message submission*

Please note that all submissions are subject to the following rules and conditions. For more details on those rules refer to document R03.

Rule R3002:

In the 'ADDRESS' class either 'ADDRESS/Street name line 1' and 'ADDRESS/Number' or 'ADDRESS/P.O.Box' has to be used.

*Explanation: Address must come with filled in Street name (on the Street name line 1 element) AND number to designate building OR Address must come with Post Office Box number.*

Condition C3034:

IF 'ADDRESS/Country' in CL733 has a country code with postal code indicator 'C',

THEN Postcode attribute in the same class is O,

ELSE it is M.

*Explanation: If address belongs to the country, which uses postcodes for all addresses (refer to R06 document for full list), then postcode must be filled. Otherwise, postcode is optional and can be left blank if it is not known.*

### 3 MAPPING POSTAL ADDRESS TO ICS2 MESSAGE ELEMENTS

Postal address can be composed of multiple non-standard attributes that need to be normalized and submitted to ICS2. In order to ensure data quality and basic data uniformity, following table describes how to handle various known postal address data and categorize them for ICS2 submission.

In case postal address contains more elements that are mapped to single element in ICS2 message, use all information separated by coma.

Recommendation: In case address for submission is not clearly separated or submission system does not use some following address elements, non-intervention is preferred over machine parsing with low degree of confidence. In that case, it is better to provide address as stored and put all information in Street line 1. Machine processing is recommended for house number still, but as duplicate extract from original address. In other words, copying it from address rather than cutting it.

Address Element	Description	Mapping in ICS2 Message
House	Name of the venue or building (Sydney Opera House, Empire State Building..)	Street name line 1
Near to	Phrases like "Near to", "Next to", "In front of" or other description in natural language including text that follow	Street name line 2
House Number	External building number. May be a compound, hyphenated number that also includes an apartment number, or a block number.	Number
Road/Street or Intersection/Junction	Road or street name or number, intersection of streets or named junction	Street name line 1
Unit	Apartment, unit, office, lot, or another secondary unit designator	Street name line 2
Level	Expressions indicating a floor number e.g. "3rd Floor", "Ground Floor", etc.	Street name line 2
Staircase	Numbered or lettered staircase designation	Street name line 2
Entrance	Numbered or lettered entrance designation	Street name line 2
PO Box	Unique identification of Post Office box	P. O. Box
Post code	Postal code used for mail sorting	Postcode
Suburb	Neighbourhood name, usually intra-city	Street name line 2
City District	Official city district name	Street name line 2
City	Any settlement type, village, town or city.	City
Island	Named island	Sub-division
State district	Second level administrative division	Sub-division
State	First level administrative division	Sub-division
Country District	Country sub-division	Sub-division
Country	Sovereign nation and dependant territory with assigned ISO 3166 code.	Country
World Region	Used for appending the country name	Not used

Table 4: Postal Address elements mapping



### 3.1 ITMATT mapping

Due widespread usage of UPU (standards for postal data exchange in form of ITMATT – Electronic communication of item information), it is very likely that source data will be available in accordance with this format. To simplify process of mapping this data to ICS2 message, refer to following table.

Address Element	Description	Mapping in ICS2 Message
Premises	Specification of the address, other than the party identification and the locality, with up to 4 lines. This is usually the street, or more generally, the premises.  Since in most common cases it features street name and house number, these needs to be filled in appropriate elements.	Street name line 1 and Number
Locality name	Free text specification of the geographical area.	City
Country code	ISO 3166–1 two-character country code.	Country
Locality code	Valid postcode designating the location concerned. Required if there is a postal code system in the country concerned. This code is not prefixed with the country code.	Postcode
Locality region	Free text specification of the country subdivision, such as state, province or similar subdivision.	Sub-division

Table 5: ITMATT Postal Address elements mapping for ICS2 message

Please see the example constructed using the rules in following table. You will find example of standard address with common elements.

Example:

POSTFACH 73, HAMBURG, 22129, DE

Disambiguation:

Element Name in ITMATT	Value	Element Name in ICS2 message	Commentary
Premises	Postfach 73	Street line 1	Street name
		Number	House number
Locality name	Hamburg	City	City, town or settlement name
Locality code	22129	Postcode	Postal code
Country code	DE	Country	Country in ISO Code

## 4 HANDLING NON-STANDARD ADDRESSES

Postal addresses in many countries do not follow the same scheme or it is permitted to omit some elements that are deemed mandatory elsewhere. If encountering these exceptional cases, it is recommended to follow these rules to fill ICS2 message.

### 4.1 Missing Street name

In some countries, mostly in rural areas it is allowed to omit street name since small villages do not have named streets and rely on house numbers only.

Example:

Kolešovice 303, 27002, CZ

Disambiguation:

Element Name	Format	Commentary
City	Kolešovice	Name of the village
Country	CZ	Country in ISO Code
Sub-division	Not used	No subdivision for this address
Street name line 1	Kolešovice 303	Use name of the city and house number
Postcode	27002	-
Street name line 2	Not used	No second line needed
Number	303	House number
P.O. Box	Not used	P.O.Box not allowed when Street line is used

*Table 4: Address format for message submission*

## 4.2 Multiple house numbers

In some countries, it is possible that building has more numbers assigned. Depending on local custom, second number may identify specific building in numbered plot or section, entrance, staircase or room. It is also possible that street name has number in it, which makes automated parsing unreliable.

If such address is encountered and entrance was done as single string (meaning person this not entered number and street line onto separate fields on via submission of the consignment), it is advised to list all detected numberings in Number element separated by coma. Such numbers should not be however extracted from Street name, but duplicated to prevent information loss during automated parsing. See table below for explanation.

Example:

61 KAKI BUKIT AV 1 #02-19 SINGAPORE, 417943, SG

Disambiguation:

Element Name	Format	Commentary
City	Singapore	Name of city
Country	SG	Country in ISO Code
Sub-division	Not used	No subdivision for this address
Street name line 1	61 KAKI BUKIT AV 1 #02-19	In this case Street name contains number, street is named "Kaki Bukit Av. 1", 61 is building, #02-19 helps to localise venue in the building as it is department store with multiple units.
Postcode	27002	-
Street name line 2	Not used	No second line needed
Number	61, #02-19	House number, both of the building and the unit inside the building. Both numbers are also preserved in Street Line 1.
P.O. Box	Not used	P.O.Box not allowed when Street line is used

*Table 6: Address format for message submission*

### 4.3 Address with no house number

In some countries, it is possible that (usually rural) addresses do not have house number. Sometimes local qualifier is used (such as “next to public school”, “70m down the road” etc.). Occasionally some African countries use unofficial solutions (mobile application that generated unique code for GPS coordinates) or simply rely on the name of the person and village name.

Example:

SELO BULATNIKOVO 700M FROM MKAD IZMAYLOVO, 142718 RU

Disambiguation:

Element Name	Format	Commentary
City	Bulatnikovo	Name of village
Country	RU	Country in ISO Code
Sub-division	Not used	No subdivision for this address
Street name line 1	SELO BULATNIKOVO 700M FROM MKAD IZMAYLOVO	In this case, Street name contains village name and local quantifier, that points to the location of the village itself (near the numbered ring road around Moscow).
Postcode	142718	Postcode extracted from address line.
Street name line 2	Not used	No second line needed
Number	N/A	As house numbering does not apply for the address, “N/A” mark is used.
P.O. Box	Not used	P.O.Box not allowed when Street line is used

*Table 7: Address format for message submission*

## 4.4 Industrial zones

It is possible that some addresses have different structure if the recipient is in industrial or commercial zone, where house numbers or street names may not apply. It is possible that address specifies entry gate, proprietary building code or other way to uniquely identify the recipient. It is also possible that no further instructions are given, as industrial zone relies on proprietary map or guidance published at entrance. Refer to the table below to provide such address correctly.

Example:

THE EAST GATE OF THE HUAIDECUIGANG INDUSTRIAL PARK SHENZHEN, 517057 CN

Disambiguation:

Element Name	Format	Commentary
City	Shenzen	Name of city
Country	CN	Country in ISO Code
Sub-division	Not used	No subdivision for this address
Street name line 1	THE EAST GATE OF THE HUAIDECUIGANG INDUSTRIAL PARK	In this case, Street name contains indication of gate in the industrial park.
Postcode	517057	Postcode extracted from address line.
Street name line 2	Not used	No second line needed
Number	N/A	As house numbering does not apply for the address, "N/A" mark is used.
P.O. Box	Not used	P.O.Box not allowed when Street line is used

*Table 8: Address format for message submission*

## 4.5 P.O. BOX address

For addresses where consignment is delivered to Post Office Box, street names or house numbers are not used. City and postcode is however still mandatory as they serve as way to find the post office where box is located.

Example:

PO BOX 1122, Los Angeles, CA, 90005, US

Disambiguation:

Element Name	Format	Commentary
City	LOS ANGELES	Name of city
Country	US	Country in ISO Code
Sub-division	CA	1 <sup>ST</sup> level administrative district
Street name line 1	Not allowed	Not allowed for PO Box address, street name usage would prevent submission from acceptance.
Postcode	90005	Postcode extracted from address line.
Street name line 2	Not allowed	Not allowed for PO Box address, street name usage would prevent submission from acceptance.
Number	Not allowed	Not allowed for PO Box address, street name usage would prevent submission from acceptance.
P.O. Box	PO BOX 1122	PO Box number listed.

Table 9: Address format for message submission

## 4.6 Address with post office in different municipality

It is possible to encounter address, where given municipality does not have post office. In these cases, one or group of municipalities are being served by post office in different municipality.

Example:

HOŠTICE 233, 387 01, VOLYNĚ, CZ

Disambiguation:

Element Name	Format	Commentary
City	VOLYNĚ	Name of city (where post office is located)
Country	CZ	Country in ISO Code
Sub-division	Not used	1 <sup>ST</sup> level administrative district, not used in Czechia
Street name line 1	Hoštice 233	Name of the village and house number. Streets in this municipality are not named.
Postcode	387 01	Postcode extracted from address line.
Street name line 2	Not used	Not needed in this example.
Number	233	House number
P.O. Box	Not used	P.O.Box not allowed when Street is used

Table 10: Address format for message submission

## 4.7 Poste restante

In some cases, addressee prefers to pick up the consignment at the post office without attempting home delivery. These addresses do not feature street name and house number, only post code of office to deliver.

Example:

POSTE RESTANTE, LOSHEIM AM SEE, 666 79, DE

Disambiguation:

Element Name	Format	Commentary
City	LOSHEIM AM SEE	Name of city (where post office is located)
Country	DE	Country in ISO Code
Sub-division	Not used	1 <sup>ST</sup> level administrative district, not used in this example
Street name line 1	POSTE RESTANTE	Instead of street line, use indication that consignment is stored at post office. It is possible to use different national languages.
Postcode	666 79	Postcode extracted from address line.
Street name line 2	Not used	Not needed in this example. Can be used for password if used.
Number	N/A	As house numbering does not apply for the address, "N/A" mark is used.
P.O. Box	Not used	P.O. Box not allowed when street name is used.

Table 11: Address format for message submission

## 4.8 City districts

In case of address which has multiple city districts and post offices serving the area, it may be needed to indicate those besides street names.

Example:

OSTRÁ 732/29, PRAHA 14, ČERNÝ MOST, 198 00 PRAHA 98, CZ

Disambiguation:

Element Name	Format	Commentary
City	PRAHA 98	Name of city (where post office is located)
Country	CZ	Country in ISO Code
Sub-division	Not used	1 <sup>ST</sup> level administrative district, not used in Czechia
Street name line 1	OSTRÁ 732/29	Name of the village and house number. Streets in this municipality are not named.
Postcode	198 00	Postcode extracted from address line.
Street name line 2	PRAHA 14, ČERNÝ MOST	Not needed in this example.
Number	732/29	House number
P.O. Box	Not used	P.O.Box not allowed when Street is used

Table 12: Address format for message submission

## 5 RECOMMENDED PARSING TOOLS

In case address gathered for the submission was not collected as structured information but as free text information, it is possible to parse address automatically with high degree of accuracy. Depending on number of expected fillings, different choice may be suitable. Please note that any approach that will yield at least same degree of accuracy as listed approached is accepted. Some degree of inaccuracy is expected in all listed methods.

### 5.1 Libpostal

Libpostal is open source C-library for parsing and normalizing postal addresses. It uses statistical natural language processing and Open Street Map database of real world addresses. Library supports over 60 languages and features local optimizations from over 100 countries. For implementation purposes it also comes with native bindings for Java, Ruby, PHP, Python and NodeJS, but it has complete documentation to allow easy integration with other languages too. There is no need to use database system or active internet connection, all information is stored locally.

Full documentation, installation guide for library compilation and bindings usage can be found in [Git repository](#).

For the purpose of ICS2, parsing using Libpostal allows for extraction of house numbers and address elements recognition that can help filling in address elements as described in [Chapter 3](#).

Libpostal needs address as string, with no need to provide previous optimizations. For example, the input:

```
250 5TH ST FLR 20 RM 1642 CINCINNATI, OH 452024263 US
```

Produces parsed result in following format:

Result:

```
{
  "house_number": "250",
  "road": "5th st",
  "level": "flr 20",
  "unit": "rm 1642",
  "city": "cincinnati",
  "state": "oh",
  "postcode": "452024263",
  "country": "us"
}
```

Which can be easily mapped into ICS2 message. It is not recommended to try to expand or otherwise process the address any further to avoid potential damage to the original meaning. Please note that claimed accuracy of over 99% applies to all international addresses, but margin for error is still very high when address is in anyway exceptional (for instance address for rural settlements, addresses using natural language quantifications such as "500m from school" or private / industrial zones).



## 5.2 Address-parser

Commercial solution offering off-line library for Java and .NET for one-time payment. Similarly to Libpostal solution it does not require active connection or database system. It is possible to publish address parsing as REST service, which can produce results that can be easily integrated with Ruby, PHP or other languages. It is possible to try the parsing [results online](#) and integration can be also done prior to purchase using [mock up API](#).

Address-parser needs address as string, with no need to provide previous optimizations. For example, the input:

```
250 5TH ST FLR 20 RM 1642 CINCINNATI, OH 452024263 US
```

Produces parsed result in following format:

Result:

```
{
  "houseNumber": "250",
  "StreetName": "5TH ST",
  "extraInfo": "RM 1642",
  "city": "CINCINNATI",
  "state": "OH",
  "countryCode": "us"
}
```

Address-parser supports 70 countries where results have good confidence levels. Results produced are comparable to Libpostal, thus it is recommended to use Libpostal over Address-parser if it is technically possible.

## 5.3 Google Geocode services

Commercial solution offering webservices to parse and geocode addresses available on pay as you go basis, where price is related to number of submitted requests. Google services are accompanied by extensive documentation and results show good level of confidence and quality across the board, including non-standard addresses.

Libraries that can ease the process of implementation are also available. For Java implementations there is possibility to use [Java Client for Google Maps](#) Services that is capable of retrieving results for entered string and produce formatted JSON response. Libraries for other languages are also available.

Address-parser needs address as string, with no need to provide previous optimizations. For example, the input:

```
250 5TH ST FLR 20 RM 1642 CINCINNATI, OH 452024263 US
```

Produces parsed result in following format when Java Client library is used:

```
{
  "longName": "FLR 20 RM 1642",
  "shortName": "FLR 20 RM 1642",
  "types": [
    "SUBPREMISE"
  ]
},
{
  "longName": "250",
  "shortName": "250",
  "types": [
    "STREET_NUMBER"
  ]
},
{
  "longName": "East 5th Street",
  "shortName": "E 5th St",
  "types": [
    "ROUTE"
  ]
},
{
  "longName": "Central Business District",
  "shortName": "Central Business District",
  "types": [
    "NEIGHBORHOOD",
    "POLITICAL"
  ]
},
{
  "longName": "Cincinnati",
  "shortName": "Cincinnati",
  "types": [
    "LOCALITY",
    "POLITICAL"
  ]
},
{
  "longName": "Hamilton County",
  "shortName": "Hamilton County",
  "types": [
    "ADMINISTRATIVE_AREA_LEVEL_2",
    "POLITICAL"
  ]
}
```

```
},
{
  "longName": "Ohio",
  "shortName": "OH",
  "types": [
    "ADMINISTRATIVE_AREA_LEVEL_1",
    "POLITICAL"
  ]
},
{
  "longName": "United States",
  "shortName": "US",
  "types": [
    "COUNTRY",
    "POLITICAL"
  ]
},
{
  "longName": "45202",
  "shortName": "45202",
  "types": [
    "POSTAL_CODE"
  ]
}
```

Documentation that lists all possible address element types is available. Due the way how payment for the service is implemented it is recommended to use the service only for addresses where offline parsing produces results with low degree of confidence.

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*End of document*