

User's manual

Connection ZSL devices to SENT GEO

Material made available to ZSL/ OBU operators

Warsaw 9.12.2022

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1 Introduction

Target process of production geolocation data delivery to production SENT GEO module data interface will covers following phases:

- External Localisation System (ELS) service Operator (or simple ELS Operator or in polish language ZSL) register yourself on PUESC (for production environment <https://puesc.gov.pl> and for testing environment <https://test.puesc.gov.pl/>),
- Provision of the list of technical identifiers of GPS locating devices by the Carrier to the ZSL Operator,
- Provision of the information necessary to start the data transfer process by the ZSL Operator to the Carrier,
- Transmission by the ZSL Operator to SENT-GEO of location data from GPS devices indicated by the Carrier.

Collecting location data by ZSL operators should occur each time one of the following criteria occurs:

- 1) **maximum after traveling 1 km or after 1 minute** depending on which event occurs later, but not less than every 5 minutes;
- 2) **when the azimuth of the vehicle's direction is changed by an amount equal to or greater than 40 degrees;**
- 3) at a standstill of the means of transport, **with the engine running, every 5 minutes;**
- 4) **before turning off the engine**, indicating where the vehicle stopped for a longer break resulting from regulations related to the driver's working time and **after switching on the engine**, thus indicating the end of the break.

Location data meeting the above conditions should be transferred from the location device to the SENT GEO module with a delay of no more than 1 minute. Location data collected by the location device can be buffered by ZSL operators, and then in a cycle of not more than 1 minute sent in packets to the SENT GEO module, with a restriction on the size, which is 500 KB and the number of minimum positions 1, and the maximum of 500 Data that exceeds 500 KB and / or 500 items should be divided into the appropriate number of packages. The data within the package can come from different devices and meet the various criteria defined above.

Examples to criterion 1:

- 1) 30 km / h - later there is a criterion of 1 km - 1 km traveled, sample sent after 2 minutes,
- 2) 60 km / h - criterion of 1 km and 1 min occurs at the same moment - 1 km traveled, sample sent after 1 min,
- 3) 90 km / h - later there is a criterion of 1 minute - 1.5 km traveled, sample sent after 1 minute,
- 4) 120 km / h - later there is a criterion of 1 minute - 2 km traveled, sample sent after 1 min.

From **April 1, 2019**, the following scheme applies: **JSON sgdi-rest_schema_v_0_61.json**.

Failure to comply with the above rules will result in **the carriers failing to fulfill their obligations under Art. 10a of the Act on the system of monitoring road and rail transport of goods**.

The transmitted data will be verified in terms of meeting the above criteria. If they are found to be exceeded, the ZSL Operators will be periodically informed of the irregularities found to remove them.

We kindly remind that the new schema (sgdi_rest_request_schema_v_0_61.json) took effect to validate data transmitted through External Localization System (ZSL). In the schema, below fields are required:

1. lat (latitude)
2. lon (longitude)
3. tsp (date and time of a sample)
4. dev (technical ID of a device)
5. brg (azimuth/bearing in degrees)
6. acc (accuracy in meters)
7. spd (speed in meters per second)

Transmitting data incompatible to the schema sgdi_rest_request_schema_v_0_61.json will have the effect of rejection the transmitted data. Moreover, data whose coordinates are outside of Poland are rejected.

We kindly please to immediate adjustment to implemented amendments. Attention should be paid to often mistakes in transmitting data:

1. 'dev' filed – transmitting device number (Znn-xxnxx-n) instead of device technical ID.
2. 'dev' field – transmitting different device number than the registered through ZSL105->ZSL120 (e.g. case sensitive, adding prefix or suffix).
3. 'lat' field - transmitting data outside of Poland. Data which fall outside the scope of 49.0 - 54.835778 should not be transmitted.
4. 'lon' field – transmitting data outside of Poland. Data which fall outside the scope of 14.116667 - 24.15 should not be transmitted.
5. 'tsp' field - transmitting data from the future which are the result of incorrect implementation of a time zone (timestamp shall specify the UTC time).
6. 'lat' & 'lon' field – too high accuracy. 10 decimal places are permitted.
7. 'spd' field – data in this field should be transmitted in meters per second.
8. 'id' field- transmitting static value in 'id' field. This field is a record ID so it should contains unique data. It could be a key field of your gps data table. This field is not required.

In case of 1) and 2) transmitting incorrect data does not give an error feedback as a result, according to the findings, External Localization System (ZSL) should transmit data of all vehicles, even those not registered. Since February 1st transmitting that kind of data results in

add a warning to a feedback.

In case of 2), in order to minimize number of mistakes during transmitting data, since February 1st, case sensitive will not be considered in 'dev' field.

In case of 3), 4), 6) and 7) transmitting that kind of data result in error 400. If a data package will contain more than one record, occurrence of at least one incorrect record results in rejection of the whole package and need of renewed transmission of the package without incorrect records.

In case of 5) data will be accepted. Since February 1st that kind of data result in a feedback which contains a warning. In future that kind of data will be rejected.

In case of 8) data will be accepted.

Currently, test interfaces operate according to the scheme `sgdi_rest_request_schema_v_0_61.json` and are enriched with additional warnings in the response.

On-Board Unit (OBU) are subject to the same rules as the ZSL devices.

Moreover, the above devices are used to collect vehicle geolocation data for both SENT-GEO and the eTOLL system.

2 Registration of ZSL/ OBU operators

A user registered to the PUESC portal - <https://puesc.gov.pl> or <https://test.puesc.gov.pl> with extended rights and being an authorized representative of the operator selects from the list (Figure 1) (FORMS→Forms alphabetically) and fills in the ZSL100 form - ZSL / OBU operator registration (Figure 2) for SENT system. The operator can provide services for both SENT-GEO and the eTOLL system. However, in the case of eTOLL, it must be on the list of operators authorized to provide ZSL / OBU services published by the Ministry of Finance - National Revenue Administration: <https://www.gov.pl/web/kas/informacje-dla-operatorow-obu-i-zsl>.

Language: PL EN Contrast: A A Font: A A A
Session will expire in: 29:13 Last successful login: 2022-11-21

PUESC TESTING ENVIRONMENT Qbis 6 Marek Tomczyk LOGOUT

MY DESKTOP SERVICES NETWORK SERVICES FORMS SINGLE WINDOW NEWS HELP

PUESC > Services > Forms >

- DUTY, BORDER , STATISTICS
- EXCISE DUTIES, GAMBLING GAMES, TRANSFERS AND TRANSPORT
- REQUESTS AND GUARANTEE HANDLING
- KAS CUSTOMER AREA
- FORMS**
- NETWORK SERVICES - INFORMATION AND SPECIFICATIONS

Forms catalog

Search for the interactive form you are interested in in the catalog below.
Follow the on-screen instructions when completing the selected form.

Mapping PUESC forms to PUESC2

Forms alphabetically

ENTER THE SERVICE NAME

A D G I K L O P R S T V W Z

SENT_ZSL100 - Rejestracja operatora ZSL/OBU [SENT] Available
Formularz rejestracji operatora ZSL/OBU

SENT_ZSL105 - Aktualizacja danych rejestracyjnych usług ZSL/OBU [SENT] Available
Formularz do zarządzania zarejestrowanymi usługami ZSL/OBU oraz urządzeniami przez operatorów ZSL/OBU

Figure 1. Fragment of the list with forms - PUESC

Language: PL EN Contrast: A A Font: A A A
 Session will expire in: 29:06 Last successful login: 2022-11-21
 Qbis 6 Marek Tomczyk LOGOUT

MY DESKTOP SERVICES NETWORK SERVICES FORMS SINGLE WINDOW NEWS HELP

My cases and documents To send and drafts My services My Data Entity data e-Documents e-Płatności

PUESC > Services > Excise duties, gambling games, transfers and transport > SENT - Road carriage monitoring > ZSL - 100 >

ZSL100 - REGISTRATION OF A ZSL/OBU OPERATOR

Save Back

1. Service operator type

SERVICE OPERATOR TYPE *
 ZSL

2. Information about ZSL/OBU service operator

2.1. BASIC INFORMATION

IDSIC IDENTIFICATION NUMBER * PL597055199600000
 IDENTIFICATION TYPE * NIP
 IDENTIFICATION NUMBER * 5970551996

FULL NAME *
 Qbis 6

2.2. ADDRESS OF RESIDENCE OR HEADQUARTERS

COUNTRY * PL-Polska
 CITY * Łódź
 POSTAL CODE * 50-256

STREET * Piotrkowska
(if there is no street, enter the word NONE)

HOUSE NUMBER * 22
(if there is no number, enter the word NONE)

PREMISES NUMBER

3. Contact details to the ZSL/OBU service operator administrator

PHONE NUMBER *
 E-MAIL ADDRESS *

4. Document own number


DOCUMENT OWN NUMBER *

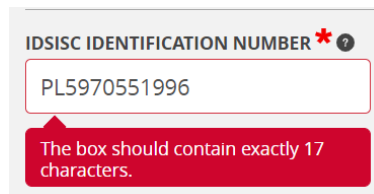
5. Email address for the system response

FEEDBACK COMMUNICATION EMAIL ADDRESS *

Save Back

Figure 2. Form ZSL100 - registration of the ZSL / OBU operator –example of filled form

The contents of the SERVICE OPERARATOR TYPE (possible options: ZSL, OBU), IDENTIFICATION TYPE (possible options: NIP, VAT UE, OTHER) and COUNTRY fields are selected by the user from the drop-down lists. The lists become visible after clicking on the red triangle in the field. The fields marked by red stars must be completed. There are also signs . After hovering over them with the cursor, a small window appears with information explaining what the given field means. In addition, if the user presses the **Save** button when the form has errors or unfilled mandatory fields, relevant messages will be displayed. These rules apply to other forms. Sample messages are presented by Figure 3, Figure 4 and Figure 5.




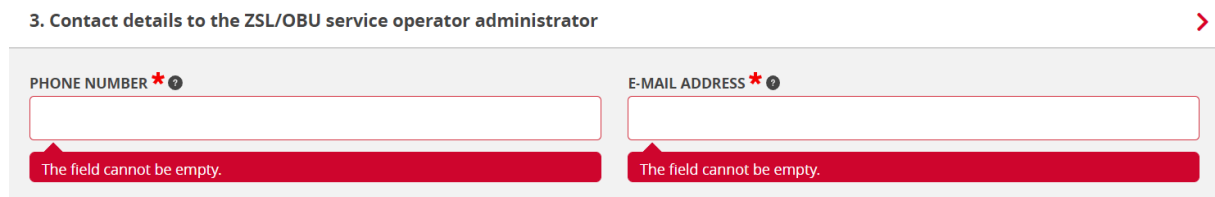

IDSISC IDENTIFICATION NUMBER * 

Figure 3. Form ZSL100 - registration of the ZSL / OBU operator – sample error message (1)



3. Contact details to the ZSL/OBU service operator administrator 


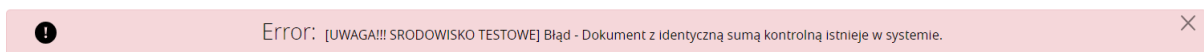
PHONE NUMBER * 

Figure 4. Form ZSL100 - registration of the ZSL / OBU operator – sample error message (2)





 Error: [UWAGA!!! SRODOWISKO TESTOWE] Błąd - Dokument z Identyczną sumą kontrolną istnieje w systemie. 

Figure 5. Form ZSL100 - registration of the ZSL / OBU operator – sample error message (3)

After correctly filling in the form, the Operator presses the **Save** button. Then, to the e-mail address provided in the form, he receives the system response. An exemplary ZSL101 is shown in Figure 6.

ZSL101 - INFORMATION ABOUT REGISTERED ZSL/OBU OPERATOR

Service operator type: **ZSL**
Service operator status: **registered**

INFORMATION ABOUT THE NOTIFICATION

Checksum: 0e32d0ca908ff9b74cab3b14fec9a1e28e4a2203

INFORMATION ABOUT REGISTRATION OF THE ZSL/OBU SERVICE OPERATOR

Creation date: 2020-09-15 godz.18:10:27
Creator: **Marek Tomczyk**
Modification date: 2022-11-21 godz.09:03:45
Modifier: **Marek Tomczyk**

INFORMATION ABOUT THE THE ZSL/OBU SERVICE OPERATOR

idSISC identification number: PL597055199600000

Full name: **GEO INFO 1.3**

Identification type: **NIP**

Identification number: 5970551996

Address information

Świętokrzyska1 12 / 21265A
00-916 Warszawa1234, PL

CONTACT INFORMATION TO THE ADMINISTRATOR OF THE ZSL/OBU SERVICE OPERATOR

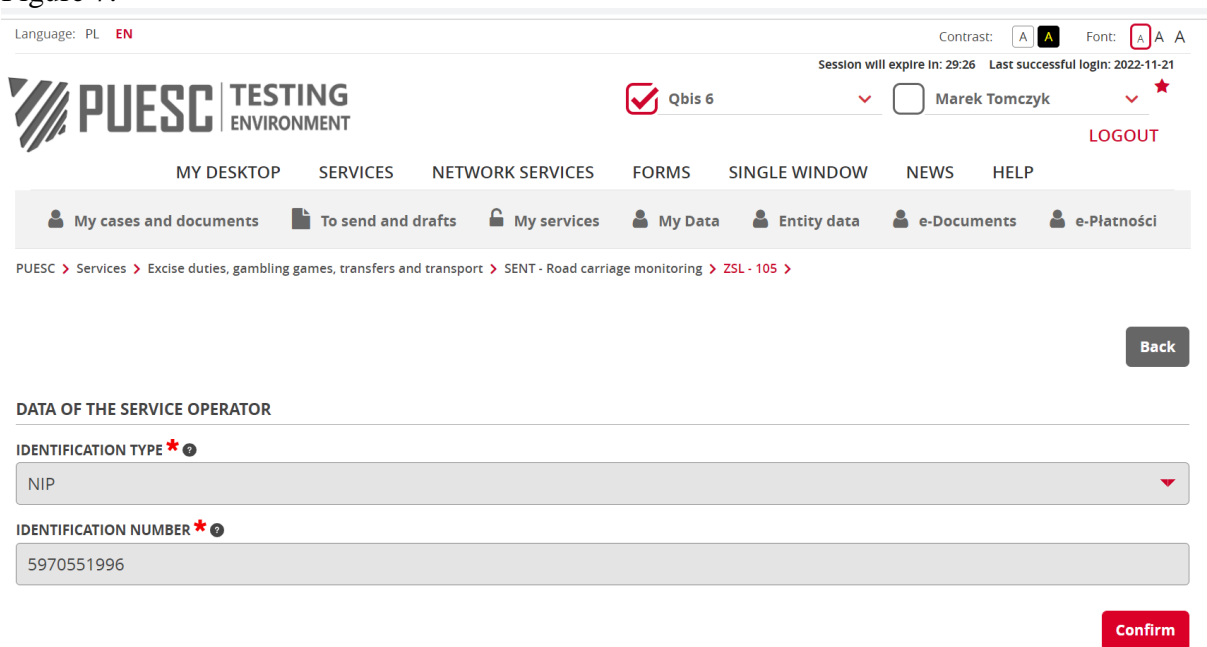
Phone number: 226663322

E-mail: marek.tomczyk.puesc@gmail.pl

Figure 6. An example of a window with a form ZSL101

3 Updating the registration data of the ZSL / OBU service

The operator selects the ZSL105 form from the list (Figure 1). A window will then appear - Figure 7.



The screenshot shows the PUESC TESTING ENVIRONMENT interface. At the top, there is a navigation bar with the PUESC logo, user information (Qbis 6, Marek Tomczyk), and session details (Session will expire in: 29:26, Last successful login: 2022-11-21). Below the navigation bar, there are menu items: MY DESKTOP, SERVICES, NETWORK SERVICES, FORMS, SINGLE WINDOW, NEWS, HELP. A secondary menu shows icons for My cases and documents, To send and drafts, My services, My Data, Entity data, e-Documents, and e-Płatności. The breadcrumb trail reads: PUESC > Services > Excise duties, gambling games, transfers and transport > SENT - Road carriage monitoring > ZSL - 105 >. The main content area is titled "DATA OF THE SERVICE OPERATOR" and contains two input fields: "IDENTIFICATION TYPE" with a dropdown menu showing "NIP" and "IDENTIFICATION NUMBER" with the value "5970551996". A "Confirm" button is located at the bottom right of the form area.

Figure 7. The window for the ZSL105 form

The operator enters his identification data into the form, including identification Type (selected from the drop-down list), Identification number, from the ZSL101 form and presses the

Confirm button. Another window appears (Figure 8). It contains current information about the operator.

The screenshot shows the PUESC TESTING ENVIRONMENT interface. At the top, there are logos for the Ministry of Finance, the National Research Institute of Telecommunications, and the State Treasury Administration (KAS). The interface includes a navigation menu with options like MY DESKTOP, SERVICES, NETWORK SERVICES, FORMS, SINGLE WINDOW, NEWS, and HELP. Below the menu, there are icons for various user actions such as 'My cases and documents', 'To send and drafts', 'My services', 'My Data', 'Entity data', 'e-Documents', and 'e-Płatności'. The main content area displays the 'ZSL101 - INFORMATION ABOUT REGISTERED ZSL/OBU OPERATOR' form. This form contains several sections: 'Service operator type: ZSL', 'Service operator status: registered', 'INFORMATION ABOUT THE NOTIFICATION' (with a checksum), 'INFORMATION ABOUT REGISTRATION OF THE ZSL/OBU SERVICE OPERATOR' (with creation and modification dates), 'INFORMATION ABOUT THE THE ZSL/OBU SERVICE OPERATOR' (with identification and address details), and 'CONTACT INFORMATION TO THE ADMINISTRATOR OF THE ZSL/OBU SERVICE OPERATOR' (with phone and email). At the bottom of the form, there are five buttons: 'Edit', 'List of services', 'List of devices', 'Print', and 'Back'.

Figure 8. Sample screen with the ZSL101 form

The user has the following options to choose from (Figure 8):

- Edit
- List of services
- List of devices
- Print
- Back

The button **Print** allows you to print the contents of the screens. In turn, the **Back** button allows you to go back to the previous system screen.

After selecting the **Edit** option, the user can update the ZSL / OBU service operator data. The window with the ZSL102 form is displayed then (Figure 9).

PUESC > Services > Excise duties, gambling games, transfers and transport > SENT - Road carriage monitoring > ZSL - 105 >

ZSL102 -UPDATE DATA OF THE ZSL/OBU SERVICE OPERATOR

Save Back

1. Information about ZSL/OBU service operator >

1.1. BASIC INFORMATION

IDSISC IDENTIFICATION NUMBER * ⓘ IDENTIFICATION TYPE * ⓘ IDENTIFICATION NUMBER * ⓘ

FULL NAME * ⓘ

1.2. ADDRESS OF RESIDENCE OR HEADQUARTERS

COUNTRY * CITY * POSTAL CODE *

STREET * HOUSE NUMBER * PREMISES NUMBER

(if there is no street, enter the word NONE) (if there is no number, enter the word NONE)

2. Contact details to the ZSL/OBU service operator administrator >

PHONE NUMBER * ⓘ E-MAIL ADDRESS * ⓘ

3. Document own number >

DOCUMENT OWN NUMBER ⓘ

4. Email address for the system response >

FEEDBACK COMMUNICATION EMAIL ADDRESS ⓘ

Save Back

Figure 9. Sample screen with the ZSL102 form

After making corrections, the user presses the **Save** button. On the other hand, after selecting the option **List of services**, the window with the ZSL114 form appears (Figure 10).

PUESC > Services > Excise duties, gambling games, transfers and transport > SENT - Road carriage monitoring > ZSL - 105 >

Add new service

List of devices

Print

Back

ZSL114 - LIST OF REGISTERED ZSL/OBU OPERATOR SERVICES

INFORMATION ABOUT THE NOTIFICATION

Checksum: 3ba6478878cc1d6013ec3cf1a0181a6f85521263

INFORMATION ABOUT THE ZSL/OBU SERVICE OPERATOR


Identification type: NIP

Identification number: 5970551996

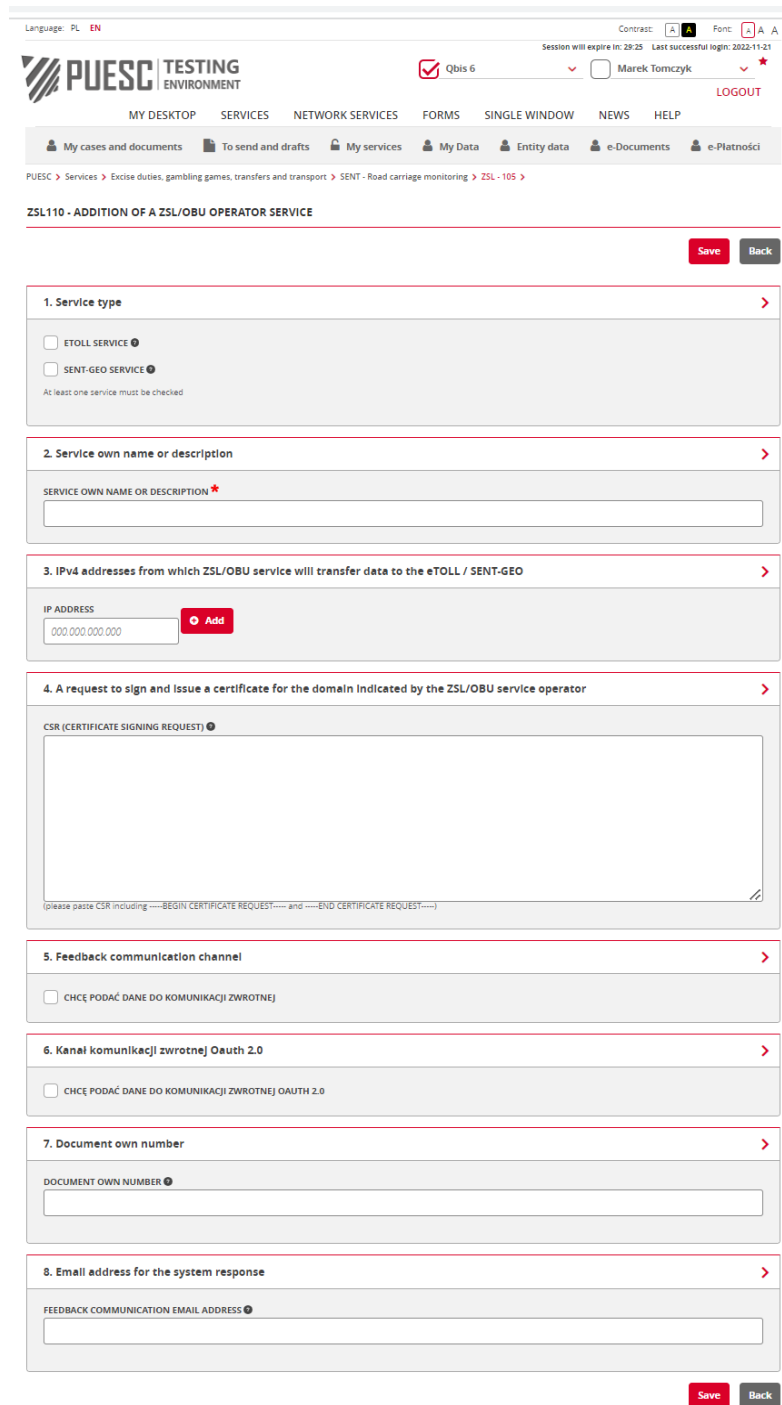
LIST OF ZSL/OBU OPERATOR SERVICES

Service number	Service own name	eTOLL	SENT- GEO	Device status	Creation date	Creator	Modification date	Modifier	Akcja
ZSL-CSGM-6	NOVA_888	<input type="checkbox"/>	<input checked="" type="checkbox"/>	registered	2022-11-22 godz. 11:05:05	Marek Tomczyk	2022-11-22 godz. 11:05:05	Marek Tomczyk	
ZSL-CSGK-0	NOVA_777	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	registered	2022-11-21 godz. 11:10:07	Marek Tomczyk	2022-11-22 godz. 08:51:02	Marek Tomczyk	
ZSL-CSFF-8	Test123455 1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	registered	2022-04-28 godz. 05:54:34	Marek Tomczyk	2022-10-06 godz. 11:55:40	Marek Tomczyk	
ZSL-CSAT-5	4334534535wygaszenie1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	cancelled	2022-03-02 godz. 12:08:59	Marek Tomczyk	2022-04-19 godz. 10:28:22	Marek Tomczyk	
ZSL-CSAS-2	645654645	<input checked="" type="checkbox"/>	<input type="checkbox"/>	cancelled	2022-03-02 godz. 12:06:01	Marek Tomczyk	2022-03-02 godz. 12:07:52	Marek Tomczyk	
ZSL-CSAR-9	kamilowamiklasowa	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	registered	2022-03-02 godz. 11:09:45	Marek Tomczyk	2022-11-04 godz. 13:53:27	Marek Tomczyk	
ZSL-CSAN-7	kamil	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	cancelled	2022-02-22 godz. 12:49:50	Marek Tomczyk	2022-02-22 godz. 13:13:19	Marek Tomczyk	
ZSL-CSAM-4	cz 1702.8	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	cancelled	2022-02-17 godz. 15:33:56	Marek Tomczyk	2022-02-22 godz. 13:42:43	Marek Tomczyk	
ZSL-CSAB-1	ziel 1602	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	cancelled	2022-02-16 godz. 08:04:12	Marek Tomczyk	2022-03-02 godz. 12:01:05	Marek Tomczyk	
ZSL-CSAA-8	cz 15.02 1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	registered	2022-02-15 godz. 14:05:50	Marek Tomczyk	2022-11-04 godz. 13:55:52	Marek Tomczyk	
ZSL-CSPZ-8	cz 15.02	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	registered	2022-02-15 godz. 14:04:25	Marek Tomczyk	2022-11-18 godz. 14:18:07	Marek Tomczyk	
ZSL-CSPY-5	TEST 15-02 (zielony)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	registered	2022-02-15 godz. 13:49:42	Marek Tomczyk	2022-02-22 godz. 13:55:36	Marek Tomczyk	
ZSL-CSPS-7	TEST 15-02 (zielony)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	registered	2022-02-15 godz. 08:39:39	Marek Tomczyk	2022-02-15 godz. 08:39:39	Marek Tomczyk	
ZSL-CSPR-4	TEST 15-02 (zielony)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	registered	2022-02-15 godz. 08:30:39	Marek Tomczyk	2022-02-15 godz. 08:30:39	Marek Tomczyk	
ZSL-CSPP-8	TEST 15-02 (zielony)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	registered	2022-02-15 godz. 08:30:18	Marek Tomczyk	2022-02-15 godz. 08:30:18	Marek Tomczyk	
ZSL-CSPN-2	TEST 15-02 (zielony)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	registered	2022-02-15 godz. 08:23:06	Marek Tomczyk	2022-02-15 godz. 08:23:06	Marek Tomczyk	
ZSL-CSPM-9	zie 1402.2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	registered	2022-02-14 godz. 16:44:40	Marek Tomczyk	2022-02-25 godz. 10:30:18	Marek Tomczyk	
ZSL-CSPK-3	zie 1402	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	registered	2022-02-14 godz. 16:43:13	Marek Tomczyk	2022-02-14 godz. 16:43:13	Marek Tomczyk	
ZSL-CSPH-4	TEST 14-02 (zielony) 5	<input checked="" type="checkbox"/>	<input type="checkbox"/>	registered	2022-02-14 godz. 13:46:20	Marek Tomczyk	2022-02-14 godz. 13:46:20	Marek Tomczyk	
ZSL-CSTF-3	eTOLL	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	cancelled	2021-10-25	Marek Tomczyk	2022-01-21	Marek Tomczyk	

Figure 10. Sample screen with the ZSL114 form

By clicking on the icon  next to the selected service in the last column - **Action** column, the ZSL111 form will be displayed (Figure 14).

Then, by clicking on the **Add new service** button, a window will appear with the form ZSL110 - ADDITION OF A ZSL/OBU OPERATOR SERVICE (Figure 11).



Language: Pl EN Contrast: [A] [A] Font: [A] [A] A
 Session will expire in: 28:25 Last successful login: 2022-11-21
PUESC TESTING ENVIRONMENT Qbis 6 Marek Tomczyk LOGOUT
 MY DESKTOP SERVICES NETWORK SERVICES FORMS SINGLE WINDOW NEWS HELP
 My cases and documents To send and drafts My services My Data Entity data e-Documents e-Platności
 PUESC > Services > Excise duties, gambling games, transfers and transport > SENT - Road carriage monitoring > ZSL - 105 >
ZSL110 - ADDITION OF A ZSL/OBU OPERATOR SERVICE

ETOLL SERVICE ●
 SENT-GEO SERVICE ●
At least one service must be checked

SERVICE OWN NAME OR DESCRIPTION *

IP ADDRESS Add
 000.000.000.000

CSR (CERTIFICATE SIGNING REQUEST) ●
(please paste CSR including -----BEGIN CERTIFICATE REQUEST----- and -----END CERTIFICATE REQUEST-----)

CHCE PODAĆ DANE DO KOMUNIKACJI ZWROTNEJ

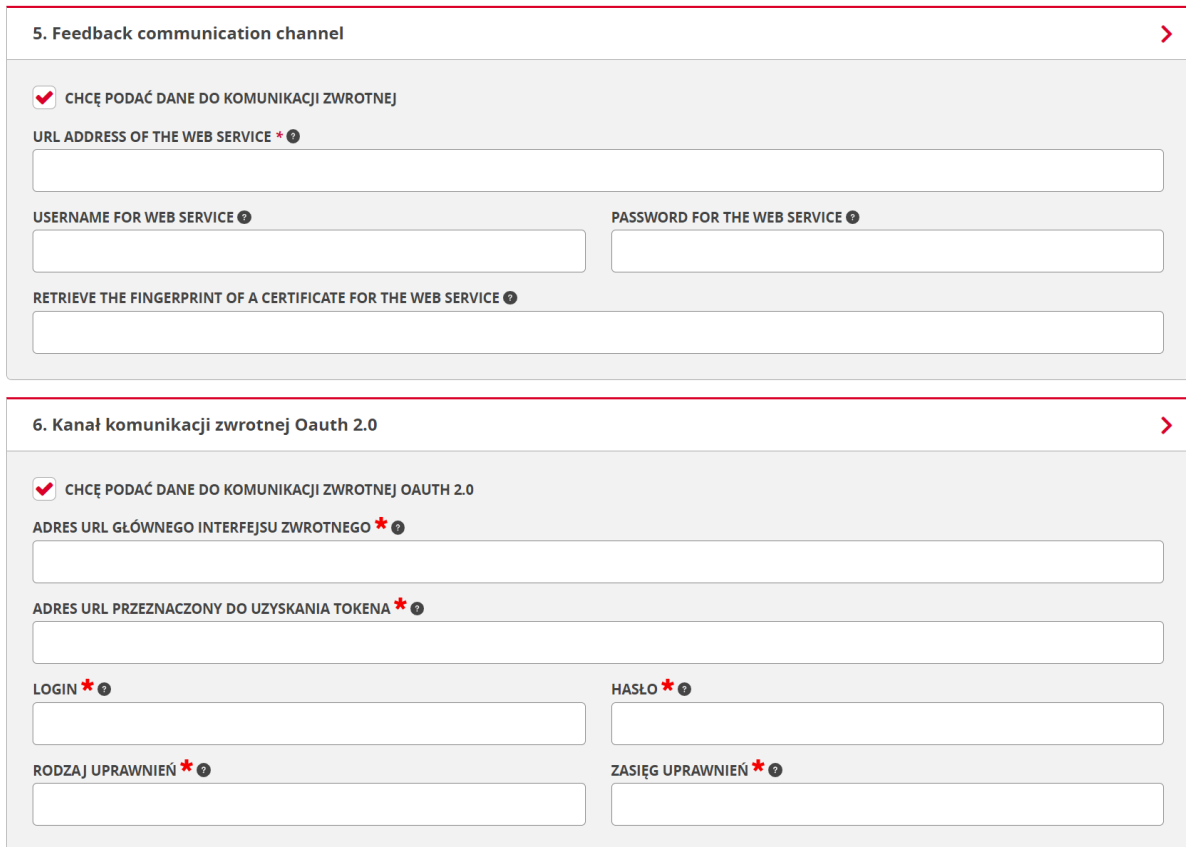
CHCE PODAĆ DANE DO KOMUNIKACJI ZWROTNEJ OAUTH 2.0

DOCUMENT OWN NUMBER ●

FEEDBACK COMMUNICATION EMAIL ADDRESS ●

Figure 11. Screen with the ZSL110 form

By selecting points 5 and 6, additional fields to be filled are obtained (Figure 12).



5. Feedback communication channel

CHCĘ PODAĆ DANE DO KOMUNIKACJI ZWROTNEJ

URL ADDRESS OF THE WEB SERVICE *

USERNAME FOR WEB SERVICE

PASSWORD FOR THE WEB SERVICE

RETRIEVE THE FINGERPRINT OF A CERTIFICATE FOR THE WEB SERVICE

6. Kanał komunikacji zwrotnej OAuth 2.0

CHCĘ PODAĆ DANE DO KOMUNIKACJI ZWROTNEJ OAUTH 2.0

ADRES URL GŁÓWNEGO INTERFEJSU ZWROTNEGO *

ADRES URL PRZEZNACZONY DO UZYSKANIA TOKENA *

LOGIN *

HASŁO *

RODZAJ UPRAWNIEŃ *

ZASIĘG UPRAWNIEŃ *

Figure 12. Screen with the ZSL110 form – additional fields

After correctly filling in the form, press the **Save** button. Example of filled form ZSL100 presents Figure 13.

ZSL110 - ADDITION OF A ZSL/OBU OPERATOR SERVICE

1. Service type >

ETOLL SERVICE

SENT-GEO SERVICE

At least one service must be checked

2. Service own name or description >

SERVICE OWN NAME OR DESCRIPTION

NOVA_777

3. IPv4 addresses from which ZSL/OBU service will transfer data to the eTOLL / SENT-GEO >

IP ADDRESS

1.	193.110.137.48	
----	----------------	--

4. A request to sign and issue a certificate for the domain indicated by the ZSL/OBU service operator >

CSR (CERTIFICATE SIGNING REQUEST)

```
-----BEGIN CERTIFICATE REQUEST-----
MIIFHjCCAwYCAQAwgA9yCzAJBgNVBAYTAiBMMREwDwYDVQQIDAhxQVJTWkFXQTER
MA8GA1UEBwwiV0FSU1pBV0ExKjAoBgNVBAoMIUIOU1RZVFUIMOFwoHDhMKEQ1pO
T8OFwppDSS5AtFBjQjELMAKGA1UECwwCWjYxYjEJAQBgNVBAMMCUtMSU1BU0FSQTEK
MCIgCSqGSIb3DQEJARYVZS5rbGltYXNhcmFAaWwtdGllLnBsMIIjANBgkqhkiG
9w0BAQEFAAOCAg8AMIICGgKCAgEAzLUjwVQkKWBOE12TNApO8NIqjngF2syeiHeH
xdKeZrw+D2S5BGr/DqAESKWjpbGyrjvM9AA+20zwl44e3ZmhbXRwLINFDPhe6w
xqRMRAuvWu/OE+52COxhjD5UZ0STf/bqhd4b+3Z5iyS0Hm3nqJebB+W1BwqQYZr
b0ss3czkktv26u21tDwkqRdS2nbhbBOnI2wwzNsYxULuLebp9fCTMv+KMtXTeo+
ZgxOt2EU/2US3/OzK3jWQdaOnuXMddDfE1JJC UyNEmEKE3LwzNLJZAgr+fhQLIX4
(please paste CSR including -----BEGIN CERTIFICATE REQUEST----- and -----END CERTIFICATE REQUEST-----)
```

5. Feedback communication channel >

CHCĘ PODAĆ DANE DO KOMUNIKACJI ZWROTNEJ

6. Kanał komunikacji zwrotnej Oauth 2.0 >

CHCĘ PODAĆ DANE DO KOMUNIKACJI ZWROTNEJ OAUTH 2.0

7. Document own number >

DOCUMENT OWN NUMBER

8. Email address for the system response >

FEEDBACK COMMUNICATION EMAIL ADDRESS

e.klimasara@iti-pib.pl

Figure 13. Screen with the ZSL110 form – filled form


Then the form ZSL111-CONFIRMATION OF REGISTRATION OF THE ZSL / OBU OPERATOR SERVICE appears (Figure 14). Preparation of the CSR (Certificate Signing Request) required in point 4 of the form has been discussed in detail in chapter 14.

Pressing the **List of devices** button (Figure 10) displayed screen (Figure 15) ZSL 123 – DEVICES LIST RELATED TO THE ZSL/OBU SERVICE. The table contains the following columns: service number, technical identifier, locator number, locator pin, device status, additional information of the GPS device, etoll, sent, register and modifier. The user can search for data in the fields of service number, technical identifier, locator number and device status. Just enter the value you are looking for in the last row in the appropriate column. For device status, select the appropriate value from the drop-down list. Possible options to choose from: ALL, 0-active, 4-deleted.

ZSL-CSFF-8	urz123	Z00-AK35SP-4	3484	0	test123	true	false	Marek Tc 2022-04-;
ZSL-CSAM-4	sasasa	Z00-AK37EZ-6	4306	0	sasasasa	true	true	Marek Tc 2022-02-;
ZSL-CSAN-7	rtet453teer3r3	Z00-AK37RN-1	9475	4	eeee	true	true	Marek Tc 2022-02-;
ZSL-CSAN-7	656546	Z00-AK37RR-7	6281	0	55	true	true	Marek Tc 2022-02-;
ZSL-CSAN-7	Z21-AW72GB-0	Z00-AK37RS-6	7258	0	ret464	true	true	Marek Tc 2022-02-;
ZSL-CSPY-5	caaaaa	Z00-AK37RY-0	3367	0	caaaaa	true	true	Marek Tc 2022-02-;
ZSL-CSAM-4	zzz111	Z00-AK37WK-9	4274	0	zzz111	true	true	Marek Tc 2022-02-;
ZSL-CSAM-4	xxx1111	Z00-AK37WN-6	2046	0	xxx1111	true	true	Marek Tc 2022-02-;
ZSL-CSAM-4	cxccxcx	Z00-AK37WR-2	7059	4	cxccxcx	true	true	Marek Tc 2022-02-;
ZSL-CSFF-8	A0001	Z00-AK39TF-7	2810	0	test01	true	false	Marek Tc 2022-05-;
<input type="text"/>	<input type="text"/>	<input type="text"/>			<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
				WSZYSTKIE ▾				

Pozycje od 21 do 30 z 1,523 pozycji Poprzednia 1 2 3

Figure 15. Sample screen with the ZSL123 form –List of devices

By electing the **Edit service** option (Figure 14), the ZSL112 form is obtained (Figure 16). In step 3, after entering each IP address, press the **Add** button. Several IP addresses can be specified. In turn, pressing the button  next to the selected IP number placed on the list removes it from the list (Figure 16).

ZSL112 - UPDATE DATA OF A ZSL/OBU OPERATOR SERVICE

Save Back

Service number: ZSL-CSGK-0

1. Service type >

ETOLL SERVICE ⓘ

SENT-GEO SERVICE ⓘ

At least one service must be checked

2. Service own name or description >

SERVICE OWN NAME OR DESCRIPTION *

3. IPv4 addresses from which ZSL/OBU service will transfer data to the eTOLL / SENT-GEO >

IP ADDRESS

Add

1.	193.110.137.48	✖
----	----------------	---

4. A request to sign and issue a certificate for the domain indicated by the ZSL/OBU service operator >

CSR (CERTIFICATE SIGNING REQUEST) ⓘ

(please paste CSR including -----BEGIN CERTIFICATE REQUEST----- and -----END CERTIFICATE REQUEST-----)

5. Feedback communication channel >

CHCĘ PODAĆ DANE DO KOMUNIKACJI ZWROTNEJ

6. Kanał komunikacji zwrotnej Oauth 2.0 >

CHCĘ PODAĆ DANE DO KOMUNIKACJI ZWROTNEJ OAUTH 2.0

7. Document own number >

DOCUMENT OWN NUMBER ⓘ

8. Email address for the system response >

FEEDBACK COMMUNICATION EMAIL ADDRESS ⓘ

Save Back

Figure 16. Sample screen with the ZSL112 form

By selecting the **Cancel service** option (Figure 14), the ZS113 form will be displayed (Figure 17).

PUESC > Services > Excise duties, gambling games, transfers and transport > SENT - Road carriage monitoring > ZSL - 105 >

ZSL113 - CANCEL ZSL/OBU OPERATOR SERVICE

Save **Back**

Service number: ZSL-CSGK-0

1. Reason for canceling the service >

COMMENTS TO THE NOTIFICATION ⓘ

2. Document own number >

DOCUMENT OWN NUMBER ⓘ

3. Email address for the system response >

FEEDBACK COMMUNICATION EMAIL ADDRESS ⓘ

Save **Back**

Figure 17. Screen with the ZSL113 form

After correctly filling the form, press the **Save** button. Example of filled form presents Figure 18. The user receives confirmation of the cancellation of the ZSL / OBU service (Figure 19).

ZSL113 - CANCEL ZSL/OBU OPERATOR SERVICE

Save **Back**

Service number: ZSL-CSGM-6

1. Reason for canceling the service >

COMMENTS TO THE NOTIFICATION ⓘ

not used

2. Document own number >

DOCUMENT OWN NUMBER ⓘ

3. Email address for the system response >

FEEDBACK COMMUNICATION EMAIL ADDRESS ⓘ

e.klimasara@itl-pib.pl

Save **Back**

Figure 18. Sample screen with service cancellation - form ZSL113

PUESC > Services > Excise duties, gambling games, transfers and transport > SENT - Road carriage monitoring > ZSL - 105 >

ZSL120 - ADDITION OR REMOVAL OF THE GPS DEVICES RELATED TO ZSL/OBU SERVICE

Data import from XML file >

LOAD XML FILE ?

Load data

Possibility to load previously prepared XML file with the possibility of further editing or changes.

Save **Back**

1. GPS devices related to ZSL/OBU service >

TECHNICAL IDENTIFIER OF THE GPS DEVICE ADDITIONAL INFORMATION OF THE GPS DEVICE

+

2. Document own number >

DOCUMENT OWN NUMBER ?

3. Email address for the system response >

FEEDBACK COMMUNICATION EMAIL ADDRESS ?


4. Feedback communication channel >

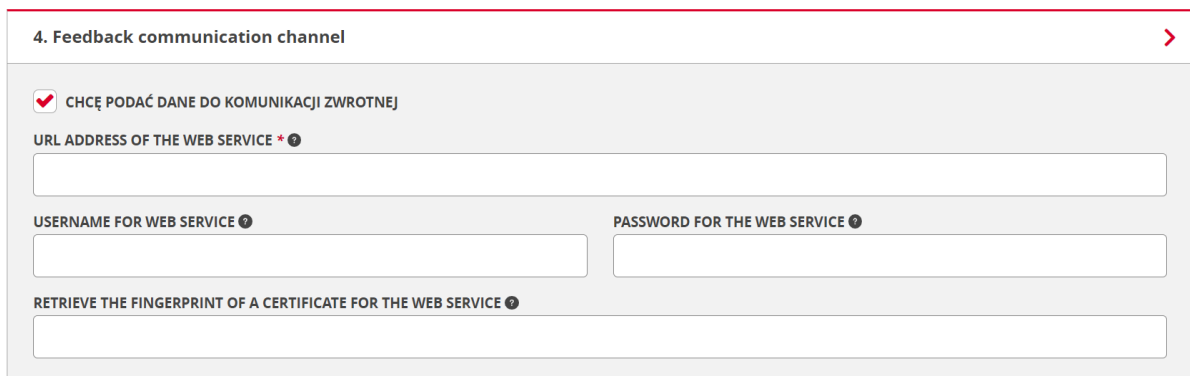
CHCĘ PODAĆ DANE DO KOMUNIKACJI ZWROTNEJ

Save **Back**

Figure 20. Screen with the ZSL120 form – addition GPS devices


In field **Data import from XML file**, by clicking the **Load data** button, you can import GPS devices to be added from an XML file compliant with the ZSL120 schema (Figure 20). The user selects the appropriate XML file and presses the **Load data** button and next **Save** button.



In step 1 – **GPS devices related to ZSL/OBU service** after filling in the fields: **Technical identifier of the GPS device** and **Additional information about the GPS device**, press the icon . By selecting point 4, are obtained additional fields to be filled (Figure 21).



4. Feedback communication channel >

CHCĘ PODAĆ DANE DO KOMUNIKACJI ZWROTNEJ

URL ADDRESS OF THE WEB SERVICE * 

USERNAME FOR WEB SERVICE  PASSWORD FOR THE WEB SERVICE 


RETRIEVE THE FINGERPRINT OF A CERTIFICATE FOR THE WEB SERVICE 

Figure 21. Screen with the ZSL120 form with additional fields

After correctly filling in the form and clicking the **Save** button, the ZSL121 form will appear (Figure 23). Example of filled form ZSL121 presents Figure 22.

ZSL120 - ADDITION OR REMOVAL OF THE GPS DEVICES RELATED TO ZSL/OBU SERVICE

Data import from XML file >


LOAD XML FILE ?

Load data


Possibility to load previously prepared XML file with the possibility of further editing or changes.

Save **Back**

1. GPS devices related to ZSL/OBU service >

1.	ABC_12345678	new	
----	--------------	-----	---

TECHNICAL IDENTIFIER OF THE GPS DEVICE ADDITIONAL INFORMATION OF THE GPS DEVICE



2. Document own number >

DOCUMENT OWN NUMBER ?

3. Email address for the system response >

FEEDBACK COMMUNICATION EMAIL ADDRESS ?

4. Feedback communication channel >

CHCĘ Podać dane do komunikacji zwrotnej

Save **Back**

Figure 22. Screen with the ZSL120 – addition GPS device filled form

Then the completes the ZSL120 form with the remaining data and presses the **Save** button. As a result, the form ZSL121 - Confirmation of registration of GPS devices is displayed (Figure 23).

List of devices

Print

Back

ZSL121 - CONFIRMATION OF REGISTRATION OR DELETION OF GPS DEVICES RELATED TO THE ZSL/OBU SERVICE

Service number: **ZSL-CSGK-0**

INFORMATION ABOUT THE NOTIFICATION

Checksum: **bee27db6b4e901e681f0d2846188cdb9a2fbaa90**

INFORMATION ABOUT THE THE ZSL/OBU SERVICE OPERATOR

Identification type: NIP

Identification number: **5970551996**

LIST OF GPS DEVICES REGISTERED IN ZSL/OBU SERVICE

Service number:	GPS device technical identifier	GPS locator number	GPS locator PIN	Device status	Additional information about device	eTOLL	SENT	Creation date	Creator	Modification date	Modifier
ZSL-CSGK-0	ABC_12345678	Z00-AK54NX-2	4511	ZSLStatusValue1	new	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2022-11-22 godz. 08:11:32	Marek Tomczyk		

Figure 23. Sample screen with the ZSL121 form – confirmation - list of GPS devices registered in ZSL/OBU service

After selecting the **Delete Devices** (Figure 14) option, the ZSL120 form is displayed (Figure 24).

PUESC > Services > Excise duties, gambling games, transfers and transport > SENT - Road carriage monitoring > ZSL - 105 >

ZSL120 - ADDITION OR REMOVAL OF THE GPS DEVICES RELATED TO ZSL/OBU SERVICE

Data import from XML file >

LOAD XML FILE ?

Possibility to load previously prepared XML file with the possibility of further editing or changes.

1. GPS devices related to ZSL/OBU service >

TECHNICAL IDENTIFIER OF THE GPS DEVICE

2. Document own number >

DOCUMENT OWN NUMBER ?

3. Email address for the system response >

FEEDBACK COMMUNICATION EMAIL ADDRESS ?

4. Feedback communication channel >

CHCĘ PODAĆ DANE DO KOMUNIKACJI ZWROTNEJ

Figure 24. Screen with the ZSL120 form – removal GPS devices

By clicking the **Load data** button in field **Data import form XML file**, you can import GPS devices to be removed from the XML file compliant with the ZSL120 schema. Next press **Save** button.

In step 1 – **GPS devices related to ZSL/OBU service**, after filling in the fields of the **TECHNICAL IDENTIFIER OF THE GPS DEVICE**, press the icon . After correctly

filling in the form and clicking the **Save** button, the ZSL121 form - confirmation of deletion GPS devices will appear (Figure 25).

[List of devices](#) [Print](#) [Back](#)

ZSL121 - CONFIRMATION OF REGISTRATION OR DELETION OF GPS DEVICES RELATED TO THE ZSL/OBU SERVICE

Service number: **ZSL-CSGK-0**

INFORMATION ABOUT THE NOTIFICATION

Checksum: 6c5bba62215b1307696ea53eb24b91e6389b563e

INFORMATION ABOUT THE THE ZSL/OBU SERVICE OPERATOR

Identification type: NIP

Identification number: 6970551996

LIST OF GPS DEVICES DELETED FROM THE ZSL/OBU SERVICE

Service number:	GPS device technical identifier	GPS locator number	GPS locator PIN	Device status	Additional information about device	eTOLL	SENT	Creation date	Creator	Modification date	Modifier
ZSL-CSGK-0	XZP_21740093					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				

Figure 25. Sample screen with the ZSL121 form – confirmation - list of GPS devices deleted from the ZSL/OBU service

By selecting the option **List of devices** (Figure 14), the user obtains the form ZSL123 - LIST OF GPS DEVICES ASSOCIATED WITH THE ZSL / OBU SERVICE.

ZSL-CSGK-0	XZP_21740093	Z00-AK54MA-4	6424	4	new	true	true	Marek Tr 2022-11-;
ZSL-CSGK-0	BCW_5877732	Z00-AK54MP-9	2563	0	new	true	true	Marek Tr 2022-11-;
ZSL-CSGK-0	ABC1234567	Z00-AK54NR-8	7364	0	nowe urządzenie	true	true	Marek Tr 2022-11-;
ZSL-CSGK-0	ABC_12345678	Z00-AK54NX-2	4511	0	new	true	true	Marek Tr 2022-11-;
ZSL-CSGK-0	GHW_47844210	Z00-AK54NZ-0	1805	0	new	true	true	Marek Tr 2022-11-;
ZSL-CSGK-0								WSZYSTKIE ▾

Pozycje od 1 do 5 z 5 pozycji

3.22.39, Serwer: 152

Figure 26). On the other hand, the **Print** option allows you to print the Device List.


ZSL-CSGK-0	XZP_21740093	Z00-AK54MA-4	6424	4	new	true	true	Marek Tr 2022-11-;
ZSL-CSGK-0	BCW_5877732	Z00-AK54MP-9	2563	0	new	true	true	Marek Tr 2022-11-;
ZSL-CSGK-0	ABC1234567	Z00-AK54NR-8	7364	0	nowe urządzenie	true	true	Marek Tr 2022-11-;
ZSL-CSGK-0	ABC_12345678	Z00-AK54NX-2	4511	0	new	true	true	Marek Tr 2022-11-;
ZSL-CSGK-0	GHW_47844210	Z00-AK54NZ-0	1805	0	new	true	true	Marek Tr 2022-11-;
ZSL-CSGK-0	<input type="text"/>	<input type="text"/>			WSZYSTKIE ▾			





Pozycje od 1 do 5 z 5 pozycji

3.22.39, Serwer: 152

Figure 26. Sample screen with Form ZSL123

The table contains the following columns: service number, technical identifier, locator number, locator pin, device status, additional information of the GPS device, etoll, sent, register and modifier. The user can set up a search filter by fields: technical identifier, locator number and device status. Device status options: ALL, 0-active, 4-removed.

By pressing the button  in the last column next to the selected device, you can remove it from the system (Figure 27).

P_21740093	Z00-AK54MA-4	6424	4	new	true	true	Marek Tomczyk 2022-11-22 07:26	Marek Tomczyk 2022-11-22 07:51	
W_5877732	Z00-AK54MP-9	2563	0	new	true	true	Marek Tomczyk 2022-11-25 06:25		
3C1234567	Z00-AK54NR-8	7364	0	nowe urządzenie	true	true	Marek Tomczyk 2022-11-21 10:31		
C_12345678	Z00-AK54NX-2	4511	0	new	true	true	Marek Tomczyk 2022-11-22 07:11		
W_47844210	Z00-AK54NZ-0	1805	0	new	true	true	Marek Tomczyk 2022-11-22 07:26		
<input type="text"/>	<input type="text"/>				WSZYSTKIE ▾				

Poprzednia 1 Następna

Figure 27. Sample screen with Form ZSL123- list of devices associated with the service - visible button 

A message will then be displayed asking for confirmation of removing the GPS device from the system. By pressing the YES button the device will be removed. In case of resignation, press the NO button.

4 Registration of the location data transmission service by the Operator of the ZSL on behalf of (in favor of) the Carrier in SENT on PUESC

This phase consists of the following steps:

- a. Operator provides:
 1. server's IPv4 addresses of these servers which will provide geolocation data delivery to SENT GEO module within registered ZSL service,
 2. SSL/TLS certificate request for clients (one SSL/TLS client certificate for all) which will provide geolocation data delivery to SENT GEO module,
 3. contact data (e-mail address and phone number) which will be used by Operator server's administrator for technical help or contact.
- b. Operator receives:
 1. the number of the ZSL service for registered geolocation data delivery ZSL service (registered service, registered ZSL service),
 2. authorization password assigned to the ZSL service for operations performed by the Service Provider,
 3. service related SENT GEO module data interface URL address provided by SENT GEO module exclusively for registered geolocation data delivery service, ZSL will send geolocation data to this SENT GEO module data interface URL address within registered service,
 4. client SSL/TLS certificate which has been used by ZSL Operator for data delivery authentication.

Note I: ZSL Operator becomes registered ZSL service Operator.

Note II: ZSL Operator register one geolocation data delivery service for one client (Carrier), or one service to support many Carriers. The ZSL operator can register any number of ZSL services.

5 Transmission by the Carrier of the ZSL Operator of the list of the technical identifiers of registered location devices

The carrier provides the ZSL Operator a list of technical identifiers of GPS devices and possibly additional information about the devices.

6 Information provided by the ZSL Operator to the Carrier

The ZSL Operator provides the Carrier the Operator's ZSL Service Number, Locator Numbers associated with the technical identifiers of geolocation devices.

7 Transmission of location data by the ZSL Operator to SENT GEO from devices indicated by the Carrier

Registered ZSL service Operator starts to delivery geolocation data for Carrier selected geolocation devices (see phase 5) to SENT GEO module data interface, geolocation data are delivered with:

- the URL address provided by SENT during ZSL service registration (Chapter 4 step b.3),
- HTTPS protocol and SSL/TLS client certificate authorisation, registered ZSL service Operator uses SSL/TLS client certificate provided by SENT during ZSL service registration or the renewed on (Chapter 4 step b.4),
- REST mechanism and HTTP POST method, send geolocation data as JSON data structures which are compatible with provided current JSON schema.

8 Sgdi_rest_request_schema_v_0_61.json

From April 1, 2019, issue 0.61 of the JSON scheme (sgdi_rest_request_schema_v_0_61.json) applies.

The introduced changes concern the rejection of data whose coordinates are from outside of Poland. Rules presents Table 1.

Table 1 Rules for rejecting data from outside Poland

Rule code	Rule	Comments
B-W06	if lon < 14.116667	Data rejection when the longitude is less than 14.116667. Refers to the western border.
B-S06	if lat < 49.0	Data rejection when latitude is less than 49.0. It concerns the southern border.
B-E06	if lon > 24.15	Rejection of data when the longitude is less than 24.15 applies to the eastern border

B-N06	if lat > 54.835778	Data rejection when the latitude is greater than 54.835778. Refers to the northern border.
L-SSW-CZ	If the geographical coordinates meet the condition: $54.9 - \text{lat} - 0.3 * \text{lon} > 0$	Data rejection in the south-west. It applies to the border with the Czech Republic.
L-ESE-UA	If the geographical coordinates meet the condition: $1.25 * \text{lon} + 20.375 - \text{lat} > 0$	Data rejection in the south-east. Applies to the border with Ukraine.
S-NE-RU	If the geographical coordinates meet the condition: $\text{lon} > 19 \text{ AND } \text{lat} > 54.5$	Rejection on data in the north-east. Applies to the border with the Russian Federation.

The data is transferred in the form of a JSON table, in which individual elements are JSON objects containing individual waypoints. The description of individual fields, validation rules and field information in Schema_v_0_61 presents Table 2.

Table 2. Schema_v_0_61

Name	Description	Validation rule	Required
id	The unique identifier of the record in the source system, the variable used for verification purposes during the testing period.	"type": "string", "minLength": 1, "maxLength": 32, "examples": ["1", "1960472"]	No
dev	The unique identifier of the locator, the maximum length of 50 characters is allowed, small and uppercase Latin letters are allowed from the ranges (a-z) and (A-Z), digits (0-9), hyphen-minus (-), underscore (_), which are a subset of the ASCII characters (American Standard Code for Information Interchange). The size of letters is not distinguished.	"type": "string", "minLength": 1, "maxLength": 50, "pattern": "^[a-zA-Z0-9\\-_]{1,50}\$", "examples": ["000000000000B1", "35A058060495422C7934"]	Yes
lat	Latitude taken from the GPS transmitter, WGS reference system 84, recommended minimum number of decimal places: 6, maximum number of decimal places allowed: 10.	"type": "number", "minimum": -90.0, "maximum": 90.0, "multipleOf": 0.0000000001, "examples": [52.0375868826, 52.172644] Rules for rejecting data from outside Poland	Yes

lon	Longitude taken from the GPS transmitter, WGS reference system 84, recommended minimum number of decimal places: 6, maximum number of decimal places allowed: 10.	<pre>"type": "number", "minimum": -180.0, "maximum": 180.0, "multipleOf": 0.0000000001, "examples": [21.1956136, 20.026094]</pre> <p>Rules for rejecting data from outside Poland</p>	Yes
alt	Ellipsoidal height taken from the GPS transmitter, unit [m], maximum number of decimal places allowed: 2.	<pre>"type": ["number", "null"], "minimum": -1000.0, "maximum": 4000.0, "multipleOf": 0.01, "examples": [10.0, 200.02]</pre>	No
tsp	Timestamp includes date and time taken from the GPS transmitter, associated with the geographical position of the record, UTC time zone, SENT GEO timestamp is similar to Epoch / Unix Timestamp, but given to the microsecond (16 digits), this is the number of microseconds that have passed since 00:00:00 Coordinated Universal Time (UTC), Thursday, 1 January 1970, the minimum value indicates 2017.09.20 00:00:00 UTC, integer.	<pre>"type": "integer", "minimum": 1505865600000000, "examples": [1506086623000000, 1511273867317000]</pre>	Yes
spd	Movement speed taken from the GPS transmitter - unit [m/s], maximum number of decimal places allowed: 2, maximum allowed speed: 56.00 [m/s].	<pre>"type": "number", "minimum": 0.0, "maximum": 56.0, "multipleOf": 0.01, "examples": [3.21, 20.0]</pre>	Yes
acc	Location accuracy taken from the GPS transmitter - circle radius in meters, maximum number of decimal places allowed: 2.	<pre>"type": "number", "minimum": 0.0, "multipleOf": 0.01, "examples": [10.14, 30.0]</pre>	Yes
brg	Azimuth - unit [grade], maximum number of decimal places allowed: 2.	<pre>"type": "number", "minimum": 0.0, "maximum": 360.0, "multipleOf": 0.01, "examples": [40.14, 230.0]</pre>	Yes

9 Method of data transfer

Data for the SENT GEO data interface is transmitted using the REST mechanism using HTTPS and the HTTP POST method. Transmitted data should be included in the JSON structure in accordance with the JSON scheme constituting an attachment to this document. Each data sample collected during a single measurement that contains data (geographical coordinates of the means of transport - latitude and longitude, vehicle speed, azimuth of the transport mode, satellite data transmission error - location accuracy, ellipsoidal height) collected at the same time (date and time of acquisition coordinates - a time stamp containing the date and time) is passed as a single JSON object. In order to limit the number of transferred data packets, data from one vehicle or from different vehicles stored within a JSON object is sent as elements of the JSON table that creates a single data packet. A single JSON table can contain from 1 (verbally one) to 500 (in words five hundred) JSON objects. The maximum allowable size of a single packet in bytes is 500 KB (say 500 Kilobyte).

10 Security of transmitted data

Currently, data transmission to the SENT GEO interface is carried out only with the use of certificates. The security set includes a dedicated URL interface + access restriction for indicated IP + SSL / TLS + authorizations using the SSL / TLS client certificate.

11 Validation of data – duties on the part of ZSL Operator

The operator is required to validate the data packet using the currently valid JSON scheme before proceeding with its transmission to the SENT GEO data interface. Validation should be carried out using software that supports validation based on schemas in accordance with the version of the JSON Schema specification given in the currently binding JSON Schema of the SENT GEO data interface. The currently valid JSON diagram of the SENT GEO data interface is in agreement with the Schema JSON Draft-061 specification.

12 Data validation – list of messages

Regarding data validation, the basic rule is that any unrecognized packet should be re-sent unless it conflicts with JSON Schema, then it should be corrected (if possible) and re-sent (packets) irreplaceable should be omitted). This should be done in accordance with the HTTP code provided (https://en.wikipedia.org/wiki/List_of_HTTP_status_codes).

Table 3 contains the most common messages in the data validation process.

Table 3. List of frequently appearing messages

Message	Rule/Warning	Operator action
HTTP 200 JSON: {"result": "OK"}	confirmation of correct validation of the sent JSON package	Not required.
HTTP 200 JSON: {"result": "OK"} with warning	Verification of transmitted data. The data has been accepted by the system. Example: "warning": { "tsp": 1505865600000001, "msg": "The timestamp value is from the past.", "code": "tsp-past", "dev": "A19-AZ37WW-0", "now": 1546728686549000, "action": "pass" }	Check the correctness of the transmitted data.
HTTP 200 JSON: {"result": "OK"} with warning	Verification of transmitted data. The data was rejected by the system. Example: { "msg": "Unknown device. Expecting technical identifier, found something similar to GPS device number.", "code": "dev-not-tech", "dev": "A19-AZ37WW-0", "action": "drop" },	Check the correctness of the transmitted data.
HTTP 200 JSON: {"result": "OK"} with warning	Verification of transmitted data. The data was rejected by the system. Example: { "msg": "Unknown device.", "code": "dev-unknown", "dev": "identyfikacja1", "action": "drop" },	Check the correctness of the transmitted data.
HTTP 200 JSON: {"result": "OK"} with warning	Verification of transmitted data. The data has been accepted by the system. Example: { "tsp": 2505865600000002, "msg": "The timestamp value is from the future.", "code": "tsp-future", "dev": "1",	Check the correctness of the transmitted data.

	<pre>"now": 1546728686549000, "action": "pass" }</pre>	
<p>HTTP 200 JSON: {"result": "OK"} with warning</p>	<p>Verification of transmitted data. The data was rejected by the system. Example: { "msg": "The device is located outside of Poland.", "code": "not-pl", "reason": { "rule": "lon < 14.116667", "lon": 12.0, "id": "B-W06", "lat": 50.0 }, "dev": "1234567890", "action": "drop" }</p>	<p>Check the correctness of the transmitted data.</p>
SSL/TLS errors	data was not provided	The operator must check what happened.
400 Bad Request	the provided data packet does not conform to the current JSON scheme or does not meet any other requirements	
	if the data package contains many geolocation packages then	the operator must divide it into smaller packages and try to provide a split package.
	if any smaller packet generated an incompatibility error,	the operator must separate it as a packet with one geolocation position.
	If the operator can correct the wrong location of the geolocation,	he should do so and send the corrected geolocation position.
	if the operator is not able to correct the wrong geolocation or did it very late,	then in this situation the geolocation location should be removed.
	incorrect geolocation location or lack of it. There are single incidents something is wrong - data is not provided.	The operator should check what's happening.

	incorrect geolocation location or lack of it. There are many erroneous geolocation positions or there is a lack,	so such transport may not be monitored at all. Such cases will be punished from 01/01/2019, the operator must check what is happening.
	if the package contains several measurement points,	divide it into as many packages as there are messages and resend each packet.
	if one of the individual packages is rejected,	it should be sent after correcting the error or omitting it.
401 Unauthorized –	data was not provided	The operator must check what happened.
500 Internal Server Error -		The attempt should be repeated. The SENT GEO team must be informed of this case.
501 Not Implemented –	wrong http method	The operator must go to the POST or PUT method and try again.
503 Service Unavailable —	service unavailable	The operator should repeat the attempt to provide data until effective. The SENT GEO team should be notified in this situation.

ATTENTION:

Result = OK informs that the data is correct in the syntactic sense (meet the schema).

Each of the warnings is an independent result of the business rule. The action field determines what effect the given rule has on the data indicated in the warning. Rules with the "drop" action have a higher priority than those with the "pass" action.

Drop rules occur in the case of:

- 1) unregistered devices,
- 2) data from outside Poland.

In the case of these rules, this can be interpreted as the lack of a legal basis for processing the data indicated in the warning.

The tsp-past rule indicates that a record has been obtained from the past for the device.

Action = pass indicates that this rule is informative and does not result in ignoring the data.

The **dev-unknown** rule tells you that the device is not recognized by the system. A prerequisite for the device to be recognized in the system is sending to SENT-GEO a correct SENT

notification with a locator correlated with this device. Action = drop, on the other hand, indicates that this rule is a filter, so all data sent in the package will not be processed further. Often the tsp-past rule is returned despite the data being rejected on the basis of another rule to inform that there is more than one problem with the data. In this case, it should be acknowledged that the devices in question were not delivered correctly to SENT GEO, as they relate to an unregistered GPS device, so the indicated location device can not be used to monitor the SENT transport.

13 Information necessary to connect the ZSL to SENT GEO

Currently, in order to connect the ZSL to SENT GEO, an advanced method based on certificates is used:

- a. based on the PUESC test portal forms (<https://test.puesc.gov.pl>).
- b. Is supported by both the SENT team and the SENT GEO team.
- c. The ZSL operator behaves in the same way as in the case of procedures on the production portal (<https://puesc.gov.pl/en/puesc>) only that using the SENT test documents on the test portal.

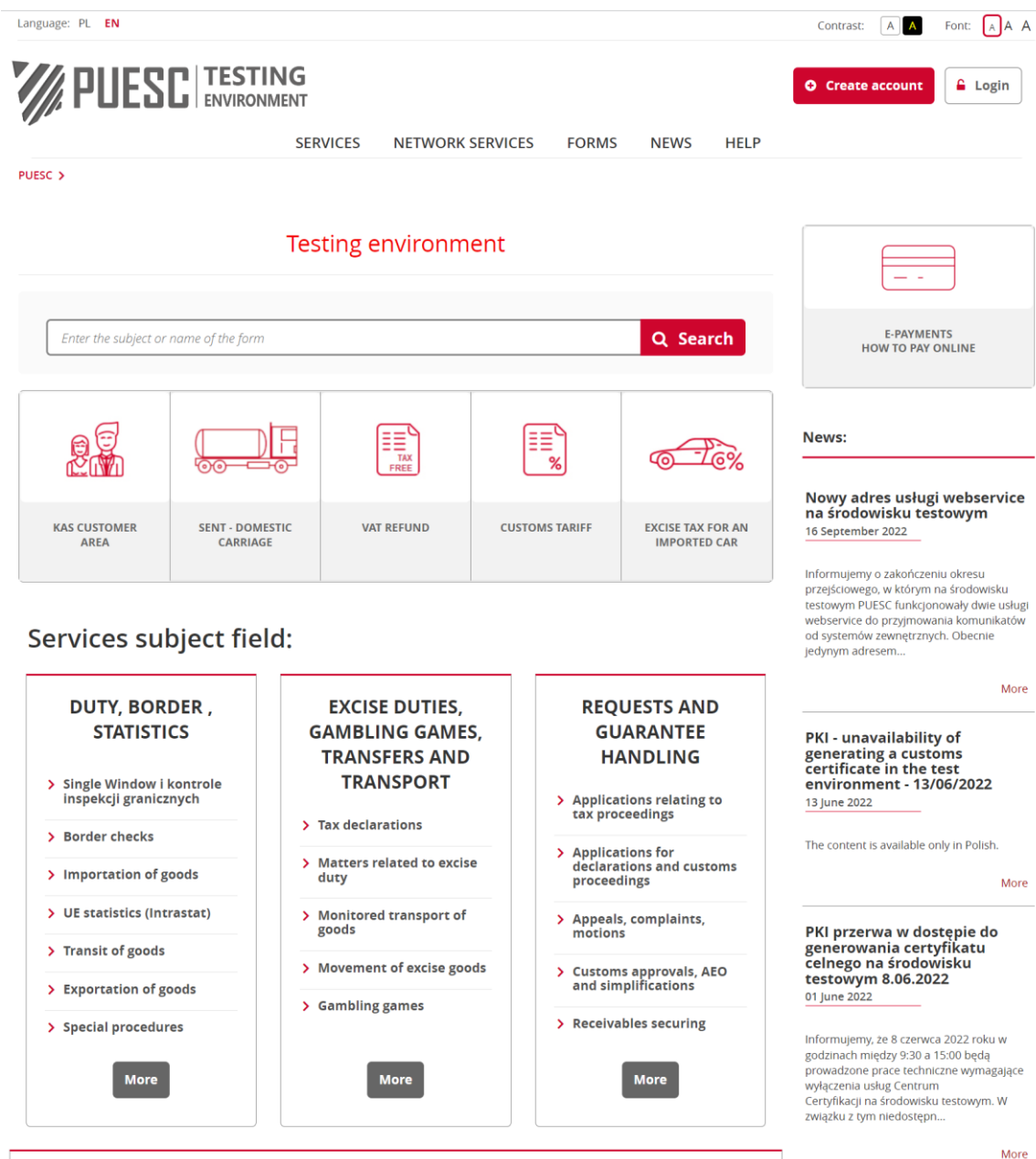
There are some technical details summary, which you should provide to your ZSL service Operator:

- A. both production and test SENT GEO data interfaces accept geolocation data which are delivered by HTTPS based REST-JSON mechanism with HTTP POST method;
- B. delivered data must be provided with JSON data structures which are compatible with provided current JSON schema – SENT GEO data interface validate delivered data against mandatory JSON Schema and reject any incompatible data;
- C. JSON Schema lets to delivered data in data packages, every package can include up to 500 geolocation positions for various geolocation devices or for the same geolocation device;

In order to receive data from ZSL devices, the **di.sent.itl.waw.pl** server was dedicated to the production environment. However, for the test environment it is **di-test.sent.itl.waw.pl**. A similar solution works for the eTOLL system.

14 Application of certificates

The ZSL operator connects to the portal <https://test.puesc.gov.pl> (I assume that he already has an account. If not then he must do it). The same rules apply to the portal <https://puesc.gov.pl>. Then the window shown in Figure 28 appears.



Language: PL EN Contrast: A A Font: A A A






PUESC TESTING ENVIRONMENT Create account Login

SERVICES NETWORK SERVICES FORMS NEWS HELP

PUESC >

Testing environment

Enter the subject or name of the form **Search**

 KAS CUSTOMER AREA	 SENT - DOMESTIC CARRIAGE	 VAT REFUND	 CUSTOMS TARIFF	 EXCISE TAX FOR AN IMPORTED CAR
--	---	---	---	--

Services subject field:

<p>DUTY, BORDER, STATISTICS</p> <ul style="list-style-type: none"> > Single Window i kontrole Inspekcji granicznych > Border checks > Importation of goods > UE statistics (Intrastat) > Transit of goods > Exportation of goods > Special procedures <p>More</p>	<p>EXCISE DUTIES, GAMBLING GAMES, TRANSFERS AND TRANSPORT</p> <ul style="list-style-type: none"> > Tax declarations > Matters related to excise duty > Monitored transport of goods > Movement of excise goods > Gambling games <p>More</p>	<p>REQUESTS AND GUARANTEE HANDLING</p> <ul style="list-style-type: none"> > Applications relating to tax proceedings > Applications for declarations and customs proceedings > Appeals, complaints, motions > Customs approvals, AEO and simplifications > Receivables securing <p>More</p>
--	--	--

News:

Nowy adres usługi webservice na środowisku testowym
16 September 2022

Informujemy o zakończeniu okresu przejściowego, w którym na środowisku testowym PUESC funkcjonowały dwie usługi webservice do przyjmowania komunikatów od systemów zewnętrznych. Obecnie jedynym adresem...

PKI - unavailability of generating a customs certificate in the test environment - 13/06/2022
13 June 2022

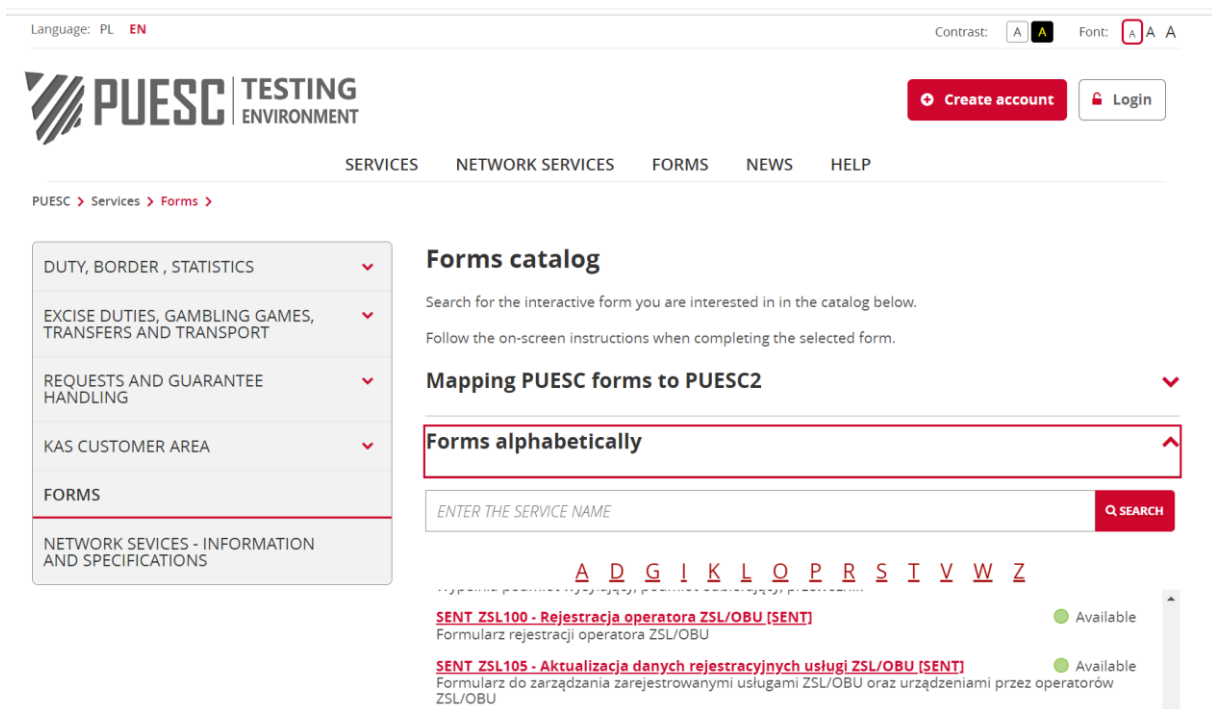
The content is available only in Polish.

PKI przerwa w dostępie do generowania certyfikatu celnego na środowisku testowym 8.06.2022
01 June 2022

Informujemy, że 8 czerwca 2022 roku w godzinach między 9:30 a 15:00 będą prowadzone prace techniczne wymagające wyłączenia usług Centrum Certyfikacji na środowisku testowym. W związku z tym niedostępny...

Figure 28 .The main window of the PUESC test portal

In the **FORMS** tab select the **SENT Forms** from the drop-down list and find SENT ZSL100 and SENT ZSL105 forms - Figure 29.



Language: PL **EN** Contrast: A **A** Font: **A** A A

PUESC TESTING ENVIRONMENT [Create account](#) [Login](#)

SERVICES NETWORK SERVICES **FORMS** NEWS HELP

PUESC > Services > Forms >

Forms catalog

Search for the interactive form you are interested in in the catalog below.
Follow the on-screen instructions when completing the selected form.

Mapping PUESC forms to PUESC2

Forms alphabetically

ENTER THE SERVICE NAME [SEARCH](#)

A D G I K L O P R S I V W Z

SENT ZSL100 - Rejestracja operatora ZSL/OBU [SENT] Available
Formularz rejestracji operatora ZSL/OBU


SENT ZSL105 - Aktualizacja danych rejestracyjnych usługi ZSL/OBU [SENT] Available
Formularz do zarządzania zarejestrowanymi usługami ZSL/OBU oraz urządzeniami przez operatorów ZSL/OBU

Figure 29. Screen with SENT forms








The ZSL operator selects the ZSL105 form (Figure 29). He see form ZSL105 (Figure 30), fill Identification type, identification number and next clics **Confirm** button. Next windows is opening choise **List of services**. When new window opens with ZSL114 form clics the button **Add new service**. The ZSL110 form will be displayed (Figure 31).

Language: PL **EN** Contrast: Font:

Session will expire in: 29:26 Last successful login: 2022-11-21

 Qbis 6 Marek Tomczyk **LOGOUT**

MY DESKTOP SERVICES NETWORK SERVICES FORMS SINGLE WINDOW NEWS HELP

 My cases and documents  To send and drafts  My services  My Data  Entity data  e-Documents  e-Płatności

PUESC > Services > Excise duties, gambling games, transfers and transport > SENT - Road carriage monitoring > ZSL - 105 >

Back

DATA OF THE SERVICE OPERATOR

IDENTIFICATION TYPE * ⓘ

NIP


IDENTIFICATION NUMBER * ⓘ

5970551996

Confirm

Figure 30. Screen with the ZSL105 filled form

Language: PL EN Contrast: [A] [A] Font: [A] [A] [A] Session will expire in: 29:25 Last successful login: 2022-11-21


 Qbis 6 Marek Tomczyk LOGOUT

MY DESKTOP SERVICES NETWORK SERVICES FORMS SINGLE WINDOW NEWS HELP

My cases and documents To send and drafts My services My Data Entity data e-Documents e-Płatności

PUEESC > Services > Excise duties, gambling games, transfers and transport > SENT - Road carriage monitoring > ZSL - 105 >

ZSL110 - ADDITION OF A ZSL/OBU OPERATOR SERVICE

Save Back

1. Service type >

ETOLL SERVICE ⓘ
 SENT-GEO SERVICE ⓘ
At least one service must be checked.

2. Service own name or description >

SERVICE OWN NAME OR DESCRIPTION *

3. IPv4 addresses from which ZSL/OBU service will transfer data to the eTOLL / SENT-GEO >

IP ADDRESS Add

000.000.000.000

4. A request to sign and issue a certificate for the domain indicated by the ZSL/OBU service operator >

CSR (CERTIFICATE SIGNING REQUEST) ⓘ

(please paste CSR including -----BEGIN CERTIFICATE REQUEST----- and -----END CERTIFICATE REQUEST-----)

5. Feedback communication channel >

CHCĘ PODAĆ DANE DO KOMUNIKACJI ZWROTNEJ

6. Kanał komunikacji zwrotnej Oauth 2.0 >

CHCĘ PODAĆ DANE DO KOMUNIKACJI ZWROTNEJ OAUTH 2.0

7. Document own number >

DOCUMENT OWN NUMBER ⓘ

8. Email address for the system response >

FEEDBACK COMMUNICATION EMAIL ADDRESS ⓘ

Save Back

Figure 31. Screen with the ZSL110 form

The individual fields of the form must be completed correctly. In field 4, you must paste the CSR (Certificate Signing Request).

CSR is generated based on your private key. You can use openssl (www.openssl.org). If the user already has a private key (e.g. private.key) then the command in the Linux environment has the following structure:

- `openssl req -new -key private.key -out certificate.csr`

If the user does not have a private key, it can be generated, for example:

- `openssl genrsa -des3 -out tech-private.key 4096`

(4096 bits gives better security than a 2048 key)

An example of a file containing a private key is shown in Figure 32.

```
-----BEGIN RSA PRIVATE KEY-----
MIIEowIBAAKCAQEAA77EQo66h5dj4n0wrgLG8J9JTheXkIHnyHdCeoh/oXt+cSAua
SvEsSeMUYYdw4fCOWeHUe55qNSphHeumgNZnyDP9vM4b+ZDWhhHeToWvvyY5iNXB
1mKuux1XP0tCsHXgPJ0ezrcbMTi5pM0QU9Fc4KKOpqIV65pjJ4IinMR1D4G3cPBD
dOOZqSmX7tHp97q+PbVbWwvUg6eISxsgQ16SZTbAoi1aG8HgIO+5i2RRdZOFj++7
KGFjwE1+UxDgsNaSp7Au/UGUCzH51iQIh9N3Kfj+cGgroGv5q66kUI27d5VTZjyf
kW4k8gvltwueKSsc9/Ordlr6YopGg5xwQr+TQIDAQABAoIBAQDePSF9cqtF9X4I
TVqk16cckQQqSU5sokTQSiDbkRQmK1S/JCrqQ5VZ6Ldz+1260DCYiiA2g1pdcy7a
zCz01ldhtHsWfVBI5HdT1eu2iJO/8Iq2DGQOgC8chQbpQ8HQ1WqVIBaF+ha3W64d
VJ1H7f4ctfxoGi8S5XH8Jtggq3JoLdeH9YqaNzQ2LKSx91/Px06J7sLya82KKUBrp
M3AOumtEt0YRy57JkV7j1YeYUFLpWT7cR5rh2cZs5r1fQTGQjQorWBU/e4Po7PMn
Vbp/qDBqni femd/dxDWydtXtJukp1mLdUSK15jAXApr2ZSXZ56espTnuIxxkvuzZ
mny15mItAoGBAP34wh8DZwvUeKiN408osSQzHEtMnefIMB0u0yoj94RQZuv8VwAR
eoTeFIEPOQggdB7MSgkgZpNuyYxW+OrQI4mM19Wh9DyHwnWTxNO7pDJEB6BCukQb
/+bdjLSytmDyVhkGM1MQ1E017MdnCRQSRURvByNRXbDzZoP7wll2bASTAoGBAPGz
HIDD1xchZkdOWNof2RDE+UbgaU86aI3dtGSsoTo6bmPkXxfe6PJPu8pLwzhVOafZ
EXH4qJ9CioE4r6PelyA944KDwx8mLBSU7E6fEchJaR6xykW8u25Nr5P304szxCTI
987eJmQq+BGUUp7LgC/qlcpir7yyP+h5CNNkAp2fAoGAecSaiCLrzacSvX1+6KXX
Jsowm5ADqBiYTSJegZ88jNQ3LyFbUNToNm13D8Rp4DVzikiGOk7jXkMs9JWNGphv
NAtTAA4xkR6KW0F4Trvc8+tXx+WDNIqk75jmZCnwmn25yKx1ruwJf1A97YFuQ+zF
rHT8Edt6a4vTEebGJm62uMCgYA06NMFH9AmqugrFW0/11mh4oD01JB7WT8sUjD/
Gw7zwXgLSCfLAnXhGrT1SEIoRAGsUE0RuHK07c0sBU3xhP1zghogqtpAKCKnC530
WcF7KxhqMGUrgH1LXpFkv5EEGwIJTD14hA3EQeSxdNnjDI216ufiukMbf62fK2JT
aMnPa4QKBgDxQkHSX8E7Fh1Uijf3C8IMZsZ7frzCbdIFNX6/PcVrcx3UKSVWmB9/v
auOMEHZmoo/FRZXdcZPI0wzcGb4oz4few2Dp2savew5QEGq4v3DZDEhGK5X7Yc+M
skL3MCgqGqVN1+fV4uFHZGqPpMKMXZHUKlpLTVVNVswe0SBfZ5U5
-----END RSA PRIVATE KEY-----
```

Figure 32. Example of a private key file

In turn, an example of a file containing CSR is shown in Figure 33.

```
-----BEGIN CERTIFICATE REQUEST-----
MIIC1zCCAb8CAQAwgZExCzAJBgNVBAYTA1BMMRQwEgYDVQQIDAtNQVpPV01FQ0tJ
RTERMA8GA1UEBwwIV0FSU1pBV0ExDDAKBgNVBAoMA05JVDELMAkGA1UECwwCWjYx
FzAVBgNVBAMMDnd3dy5pdGwud2F3LnBsMSUwIwYJKoZIhvcNAQkBFhZlLmLtsaW1h
c2FyYUBpdGwud2F3LnBsMIIBIjANBgkqhkiG9w0BAQEFAAOCAQ8AMIIBCgKCAQEA
77EQo66h5dj4n0wrgLG8J9JTheXkIHnyHdCeoh/oXt+cSAuaSvEsSeMUYYdw4fC0
WeHUe55qNSphHeumgNZnyDP9vM4b+ZDWhhHeToWvwyY5iNXB1mKuux1XP0tCsHXg
PJOezrcbMTi5pM0QU9Fc4KKOpqIV65pjJ4TinMR1D4G3cPBDd0OZqSmX7tHp97q+
PbVbWwvUg6eISxsgQl6SZTbAo1aG8HgIO+5i2RRdZOFj++7KGFjwEL+UxDgsNaS
p7Au/UGUCzH51iQIh9N3Kfj+cGgroGv5q66kUI27d5VTZjyfkW4k8gvltwueKScs
c9/Ord1r6YopGg5xwQr+TQIDAQABoAAwDQYJKoZIhvcNAQELBQADggEBADjODu1l
Wqp2GJ/8nam/bjnh2WNSczQ0FjQ6IiK/+rh1Bforeky0J9cz+hRsZt5m9D8UVWkC
u4a/iJicrMZHPhTbC9tKuAk2c29ErXKJeSxR/anRKg9EbD7AB4RFmEjsJo/yRauL
oHetcTqxNPDBspkCmo2eRrKb2LdhCGFQRG4Wx/Gg6iuzd7zZKnOVKMueLpOP/vTz
Gu6QUdi2kpg/cr5A1rwq4d5uIEag1vi9G8YXNa/wkqOrNsuP660Wj8u9QgIWpWdV
ikYJShaHRHFxk3Qr//3P3lg0vqc4AuDcs/r4a01ET7dzuIt0qZymoQKPU0wXpfgY
gxjEmtwLRv5BgM8=
-----END CERTIFICATE REQUEST-----
```

Figure 33. An example of a file containing CRS

More details can be found at:

<https://uk.godaddy.com/help/apache-generate-csr-certificate-signing-request-5269>

In field 8 of the ZSL110 Return communication channels form, enter the e-mail address to which we will receive the system response.

In the ZSL111 form, the ZSL Operator receives the client's certificate encoded in base64 format.

It should be decoded. **Do not add the BEGIN / END CERTIFICATE** line to it, you only need to use a tool that can decode Base64 encoded text, e.g.:

- Notepad ++> Plug-ins> Mime Tools> Base64 Decode
- openssl base64 -d -in file_with_certificate_from_ZSL_111.txt -out certificate.pem
- Website <https://www.base64decode.org/>
- Certutil -decode file_with_certificate_from_ZSL_111.txt certificate.pem (for Windows using the command line).

An example of a certificate in base64 is shown in Figure 34.

```
LS0tLS1CRUdJTiBDRVJUSUZJQ0FURS0tLS0tCk1JSUVqekNDQW5jQ0FnRlhNQTBlhQ1NxrR1NjYjNEUUVQ3dVQ  
U1DQXhIakFjQmdOVk1BTRU1GVUSyS25ScFptbGokWVhSbE1FRjFkR2h2Y21sMGVUQWVGdzB4T0RBNU1USXhNRE  
V3TWpkYUz3MHhPVEE1TVRJeE1ERXDNamRhtU1HRgpNUKf3RGdZRFZRUURFd2RvYyIxbExuQnNNU113RkFZRFZ  
RUUtFdzFVYyIxbExuQnNjSE53TG1vdU1Rc3dDUV1EC1ZRUUdFd0pRVERFYk1Ca0dB0MVVQ0JNU2VtRmphRz1r  
Ym1sdmNH0XRiM0p6YTJsbE1SRXEded11EV1FRSEV3aHoKZW1ON1pXTnBiaKvjTUJvR0NTcUdTSWIZrFFFskFSW  
U5ZV1J0YVvc1QWFOXRaUzV3YkRDQ0FTSXdEUV1KS29aSQpodmNOQVFFQkRQUrNz0VQQURDQ0FRb0NnZ0VCQU  
1RMVp5Y1NnZ1hMRzRwSC9TWExvYWJZTjVsa3NCcTFpcXorCmVucTBPMVkoenRiRkYvZ1ZYWHPc1JwZEFnYWF  
ieGNGZUdTNzJYkVPMGtEeThjN1cVdmpMcVQwSGFuZEt3QUwKv1B5bndGaDAwR2RjRwJaTVRNTG1jEz4aU9B  
NzhNd1Z5R3VzTTNSNlp2Y0tvQ204bWVpK2NVOEpoTENpWtdwQgpaRT1vZnN1RWNxd2Z1Mj10QWFMVTZOT1FVS  
1QyQj1hukIwMmJQVHZwQX1idwE5VHpfK2h2ZjIyQ290S5m9FMXh6CkE0WHI0REFEM0dms1VDMnZmZ31UMHBkbm  
c0e1Jpa1U5TGRpR05ja1VGM0FTUJQM1o3amZrMHgvW1JKRzg3dWIKZWJWM11DMEFRbj1vcURLcS9LRW15d3p  
jaW9wbHE1Nw1QVzZOQnFRDNNaHBi0wNjczZVQ0F3RUFBYU55TUhbDwpDUV1EV1IwVEJBSXdBREFkQmdOVkhR  
NEVGZ1FVNGFqcFRmekVtWmt1ZzJicRxejVSS1Nr0wNVd0RnwURWUjBQCfRSC9CQVFEQWdPSU1CTUdBMVvKS  
1FRtU1Bb0dDQ3NHQVFVRk1J3TUNNQjhHQTfVZE13UV1NQmFBRk11bd1aQUQk81NERiOTQzd1dJNDUrc1Z3ck  
NNQTBHQ1NxrR1NjYjNEUUVQ3dVQWUe0SUNBUUjYmZRDUNkV0hHhZ0hiM1dMQpIUdu2QXy2Wkk3b2sZaVA1bXp  
xUmzrRHn3SU5wNHJWkHvcmpPQFDDHcyan1NeU1obU1kOFJ1bm1hUUNSvUk4CnBXcXdhL1J0Q11idEdEL0pH  
bEJzdnR5bzVjd3A2Tm9tVFB5TE55wVhLMUJUwmo3RwzXR1g3aH10SGRWNHbaZC8KMTk0V2hucnr3SV1UBw1NV  
HkvL3VubHhwbU9ieG95MmRyZXYOT1nYVROeThNbnVYNGNuNm03dmVsbURmRTVjKwptRGN4VUE5MjNLcX1jMm  
V1M1Fr0VpNdk5FanVES3d0eGhYNzMyRwdseG8yYk5IwMvPQVNBwXVBbEFqZ2J1JdfQzCktUeXRKMcT1amo1dF1  
hS2rNkRSNGZSVUfUjErb2xTYj1TUTU3dkQ5RwC3ZUXabXHCQ3VDdHhwZ2JUzVdTFUkU1K1L0h2UVhVWnQ0  
aDc2RNd0c01VdWdYn1dCRWgzZ0thNjFDZTUybtRzY1h1YmpjMVBUtUE3eXRXkaUNEeGtonQpSMW5WVRkeF1oM  
FdTcWNEUy8zS11mVkJZe1Y0eHhZUwhuVH1VcndxNET1M3p2bXN1v2k5bMzWexCvUEVpZTNRCLznUDRtUVpuYn  
Byd1h1aUu5M2FvVnhDVk1VRzZzemhemNvVhd4YnZBeT1BZ1JGaEJ1S0g1TTE1Q0FrQUp3MwGkKb1CV3pXb3B  
UY29EN1NxnuthVm84RVQyM29rZUpqMGY5TK9EN1pOV2wrVzB5bk1aK0dYTKc0Z0FWS0J1M3BibgphdWiyY1Vk  
T1NmWw5obU9aUudNwWtpSU0rR2IwdXpJdHdraEN10StwWwE4T2xvOFBPN2NTWHBScUfPofJJS3hDCndYBgwxV  
1Ayk3hhbHZsUnhudjhsVHZxc2VRPT0KLS0tLS1FTkQgQ0VSVe1GSUNBVEUeLS0tLQo=
```

Figure 34. Certificate encrypted in Base64

An example of a certificate decoded in PEM (Privacy-Enhanced Mail) format is shown in Figure 35.

Each certificate begins and ends with lines:

```
----- BEGIN CERTIFICATE -----  
----- END CERTIFICATE -----
```

The above lines indicate the beginning and end of individual certificates.

The scope and manner of data usage, which are used to secure TLS communication, is different and depends on the system / application used by the entity. However, the typical requirements of SSL / TLS tools / components include the use of the following elements during SSL authentication:

- client certificate;
- private key - which protects the possibility of using a client certificate only by the entity that is its administrator;
- the certification chain / certificate chain that authenticates the client's certificate as a certificate issued by the appropriate CA and contains:
 - CA certificate (Authorization Center) level 1, which issued the client's certificate,
 - CA certificate (Authorization Center) level 0, which issued a CA level 1 certificate.

In a Linux environment, the connection to the SENT GEO can be tested using the curl tool. The command sequence is shown below. Certificate.pem means the certificate obtained in ZSL111, which was decoded from the base64 format to the PEM format. Whereas fd1.key means the private (decrypted) key used to generate CSR.

```
curl -X POST --cert ./certificate.pem --key ./fd1.key -H 'Content-Type: application / json'  
-H 'cache-control: no-cache' -d '[{"id": "1960472", "dev": "ALBS8_74718", "lat":  
52.17264488, "lon": 21.1956136, "alt": 140.0, "tsp": 1505893301000000, "spd": 0.0,  
"acc": 15.17, "brg": 0.0}, {"id": "1960473", "dev": "ALBS8_74718", "lat":  
52.17264546, "lon": 21.195608, "alt": 138.0, "tsp": 1505896249000000, "spd": 10.0,  
"acc": 15.17, "brg": 0.0}]' https://di-test.sent.itl.waw.pl:443/10000000-0001-1001-0001-00000000000001
```

Note 1: The address <https://di-test.sent.itl.waw.pl:443/10000000-0001-1001-0001-00000000000001> should be replaced with the received address in ZSL111 form, it is about the content of the **URL address of the SENT-GEO service dedicated to communication with the ZSL / OBU service**. Example SENT-GEO address for the test environment:

<https://di-test.sent.itl.waw.pl:8443/6f67a0b7-61df-4c78-8b55-c3f612ec406f>.

The same should be done with the URL address of the eTOLL service dedicated to communication with the ZSL / OBU service. Example eTOLL address:

<https://spoe-dev.il-pib.pl:8443/zsl/ssl/6f67a0b7-61df-4c78-8b55-c3f612ec406f>.

Note 2: X.509 certificate of the SSL / TLS client on the ZSL side

The duties of the ZSL service operator include:

1. obtaining the above certificate:

- the first as a result of registering the ZSL service,
- each subsequent one before 365 days have elapsed since the previous certificate was issued;

2. using the current X.509 SSL / TLS client certificate to authenticate communication with the SENT GEO data interface.

The first X.509 SSL / TLS client certificate is issued in response to sending a request to the SENT on PUESC to issue an X.509 SSL / TLS client certificate request in the content of the ZSL110 message via one of two available forms of communication:

1. XML document;

2. the registration form for the ZSL service completed on the SENT service page on the PUESC portal (puesc.gov.pl).

Another certificate can be obtained by sending to SENT on PUESC a request to issue an X.509 SSL / TLS client certificate in the content of the ZSL112 message via one of two available forms of communication:

1. XML document;

2. the ZSL service data update form completed on the SENT service page on the PUESC portal (puesc.gov.pl).

The X.509 SSL / TLS client certificate used for ZSL authentication during communication with the SENT GEO data interface is the first of the certificates returned by SENT to PUESC in response to sending the above-mentioned ZSL110 or ZSL112 messages or the above-mentioned forms. Each of the returned certificates begins with the line "----- BEGIN CERTIFICATE -----" and ends with the line "----- END CERTIFICATE -----".

The X.509 SSL / TLS client certificate expiration date can be viewed using the free OpenSSL toolkit using the following command:

```
openssl x509 -inform PEM -enddate -noout -in file_with_customer_certificate_x509.pem
```

where:

- `file_with_certificate_klienta_x509.pem` - is an example of a file containing the X.509 SSL / TLS client certificate issued by PUESC.

An example of the answer to the above command is given below:

```
notAfter = Sep 30 08:30:58 2020 GMT
```

where:

- notAfter - the label of the "no later" field from the X.509 certificate, which contains the certificate's expiry date, after which it should neither be used nor trusted;
- Sep - three letter abbreviation of the month name, in this case it is abbreviation September, or September;
- 30 - day;
- 08:30:58 - hour, minute and second;
- 2020 - year;
- GMT - three letter abbreviation of the time zone name, time zone designation, in this case it is an abbreviation of Greenwich Mean Time, which means that to get the time for the Europe / Warsaw time zone, add 2 hours for the daylight saving time and one one hour for winter time.

15 Tests

If the Carrier sending data to the SENT GEO system via the ZSL or the ZSL Operator want to test whether their data is correctly transmitted and stored in the SENT GEO TEST database, they can:

- Register as entities on the TEST PUESC portal (test.puesc.gov.pl), both the Carrier and the ZSL Operator,
- Register the ZSL service - only ZSL Operator.
- Register your test recorders:
 - Carrier,
 - ZSL Operator.
- Send location data to SENT GEO TEST,
 - from the Carrier's locators,
 - from the ZSL Operator locators.
- Verify:
 - in ZSL logs, does the response returned when transferring data to the JSON REST interface contain confirmation of correct data reception or information about the lack of non-compliance of transmitted data with the JSON scheme - only the ZSL Operator,
 - with the use of SENT 406 on the PUESC TEST, or the last saved in the SENT GEO TEST location of the locator corresponds to the transmitted data or not - Carrier for its locators, ZSL Operator for its locators,
 - with the use of the Mobile Driver's Application SENT GEO TEST, whether the last location stored in the SENT GEO TEST corresponds to the transmitted data or not - Carrier for its locators, ZSL Operator for its locators.

In the case of the production system SENT GEO, ZSL Operator may inspect logs, and the Carrier may use SENT 406 on the PUESC portal (puesc.gov.pl).

16 Contact

For help, please contact the HelpDesk via the following links:

<https://test.puesc.gov.pl/en/pomoc>

<https://puesc.gov.pl/en/pomoc>

or e-mail:

helpdesk-eclo@mf.gov.pl

17 Good advice

In order to avoid the most common errors, it is recommended to:

- Validating the values of attributes included in a single data sample (a single JSON object) before it is added to the sample package (JSON table) so as to eliminate samples whose attributes do not meet the limits of the values given in the JSON scheme (eg samples from outside Poland) . Validation can be carried out in several ways:
 - using the currently valid JSON schema, after encapsulating a single JSON object in the JSON table,
 - using a slice of the currently valid JSON schema that applies to a single package,
 - using programmatically supported validation of individual data in terms of their compliance with the rules defined in the JSON scheme.
- elimination of samples containing the location (latitude and longitude) of vehicles from non-defined Polish territory in the JSON scheme;
- specifying in vehicles the speed of vehicle movement expressed in meters per second [m / s], instead of incorrectly specifying the speed in km / h.

18 Interface for downloading the last location by ZSL operators

The interface for downloading the last location by ZSL operators has been made available only for production data.

In communication with the interface, use only TLSv1.2 secured HTTPS protocol.

The interface will be available at the address consistent with the pattern:

<https://di-status.sent.itl.waw.pl:<port>/<path>/<zsl>>

where:

<port>: is compatible with the port specified in the SENT-GEO service URL dedicated to communication with the ZSL service,

<path>: is compatible with the path specified in the URL of the SENT-GEO service dedicated to communication with the ZSL service,

<zsl>: is the ZSL service number.

For example, for the operator ZSL-XXXX-0 using the data interface:

<https://di.sent.itl.waw.pl:6666/abcdefgh-ijklmnop-rstuvwxyz>

the interface to verify the data transferred will be:

<https://di-status.sent.itl.waw.pl:6666/abcdefgh-ijklmnop-rstuvwxyz/ZSL-XXXX-0>

Access to the interface is possible only with the use of the current certificate (the last one obtained on the occasion of the creation or update of the ZSL operator data) and from the declared IP addresses.

The query may be performed no more frequently than once per hour + - 1 minute (tolerance introduced mainly due to time synchronization). In the case of more frequent queries, an HTTP 429 error will be returned (example content further), and the time after which another query can be made will be extended by one minute. If the carrier changes the list of registered GPS devices related to the given ZSL service, it is possible to interrogate the interface after 5 minutes from the last poll.

In the case of a positive answer, JSON is returned in which:

- the *devices* object contains a list of objects, where the key is the technical identifier of the device, and the value of the object containing the sample time (tsp), length (lon), width (years), as well as the time of receiving the sample (recv); if there is no data for a given GPS device, these 4 variables are not returned,
- the *next* object contains the time in milliseconds in UTC, when the next query to the interface can take place.

Example of the correct answer:

```
{
  "next": 1552551621771000,
  "devices": {
    "dev-1": {},
    "dev-2": {},
    "dev-3": {
      "tsp": 1552351029000000,
```

```

        "recv": 1552351029000000,
        "lon": 21.123456,
        "lat": 52.123456
    },
    "dev-4": {
        "tsp": 1552551533000000,
        "recv": 1552551535000000,
        "lon": 20.654321,
        "lat": 50.654321
    }
}
}
}

```

In the case of too frequent polling, an HTTP 429 error will be returned in JSON format, in which:

- the *result* object has the value "error",
- the *next* object contains the time in milliseconds in UTC, when the next query to the interface may take place,
- the *error* object contains an error message and an error code (429).

Example of HTTP 429 error:

```

{
  "result": "error",
  "next": 1552552265475000,
  "error": {
    "msg": "Too many request.",
    "code": 429
  }
}

```

Possible error codes together with descriptions that may occur can be found in Table 4.

Table 4. List of errors

Error code	Cause
HTTP 429 with JSON	Too frequent polling. Example above the table.
HTTP 429 without JSON	Too many connections from one IP address (more than 6 queries per minute).
HTTP 400 without JSON	An invalid HTTPS message has been sent.
HTTP 405 without JSON	A different HTTP method was used than GET.
HTTP 503 without JSON	Technical break.
HTTP 500 without JSON	An error occurred in the operation of the service.
HTTP 404 without JSON	Use the interface address that does not match the pattern, or use the address in which <path> or <zsl> has unrecognized syntax.

HTTP 401 without JSON	Authorization error caused by using a certificate other than that received in message ZSL111.
HTTP 401 code = 401.3	The address uses an unregistered <path> value, please correct the address used.
HTTP 401 code = 401.4	The address uses the <path> value registered for a different port than the one specified in <port>, please correct the address used.
HTTP 401 code = 401.5	The address uses the <path> value registered for another ZSL operator than specified in <zsl>, the address used should be corrected. An example below the table.
HTTP 401 code = 401.6	The serial number of the certificate does not match the certificate registered for this address, use the last certificate received.
HTTP 401 code = 401.7	The fingerprint of the certificate does not match the certificate registered for this address, use the last certificate received.
HTTP 401 code = 401.8	Communication with the interface took place from an unregistered IP address, the list of addresses for the interface should be completed with the help of the ZSL112 message.

Example of error:

```
{
  "result": "error",
  "error": {
    "msg": "Access denied to Endpoint abcdefgh-ijklmnop-rstuvwxyz for ZSL with id ZSL-XXXX",
    "code": "401.5"
  }
}
```