

National Bank of Serbia

NBS IPS QR Code Generator / Validator – API service



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1.1. Guidelines for using the NBS IPS QR Generator / Validator – API service

Through the NBS IPS QR Generator / Validator – API service (*Application Programming Interface*), the National Bank of Serbia enables users to:

1. Generate NBS IPS QR codes;
2. Validate generated NBS IPS QR code.

Also, through the NBS IPS QR Generator / Validator – API service, users can validate created IPS QR codes marked (PT and EC) – IPS QR codes of merchants at the point of sale, though in order to use these codes, merchants must be in a contractual relationship with the acquiring bank.

NBS IPS QR Generator / Validator – API service is free to use.

When using the generated NBS IPS QR code, it is obligatory to state **the NBS IPS QR next to, below or above the NBS IPS QR code placed on e.g. invoices.**

As this document is intended only to clarify the use of the NBS IPS QR Generator / Validator – API service (hereinafter: Service), more detailed information regarding the use of the NBS IPS QR code can be found in the Recommendations regarding the data used in this code and how to use it: <https://ips.nbs.rs/PDF/pdfPreporukeValidacijaEng.pdf>

2. Service usage methods

2.1. Method **gen**

URL

`https://nbs.rs/QRcode/api/qr/v1/gen` ili `https://nbs.rs/QRcode/api/qr/v1/gen/{size}`

Localization

It is possible to add a *lang* parameter to the URL that specifies the language / alphabet of the error that will be returned in *response* in the event of a faulty NBS IPS QR code (hereinafter: NBS IPS QR). The supported *lang* parameter values:

sr_RS_Latn – Latin

sr_RS – Cyrillic

en – English

If the parameter *lang* is not specified, the default language / alphabet is Latin.

Example: `https://nbs.rs/QRcode/api/qr/v1/gen?lang=sr_RS`

Description

This method returns a binary image of the NBS IPS QR to the user. In the event that the data sent in this way does not comply with the specification of the NBS IPS QR, the user will receive information that the NBS IPS QR does not comply with the specification, **without any further explanation.**

Request

Parameter sent in the body (POST) is of type JSON:

```
{
  "K": "PR",
  "V": "01",
  "C": "1",
  "R": "845000000040484987",
  "N": "JP EPS BEOGRAD\r\nBALKANSKA 13",
  "I": "RSD3596,13",
  "P": "MRĐO MAČKATOVIĆ\r\nŽUPSKA 13\r\nBEOGRAD 6",
  "SF": "189",
  "S": "UPLATA PO RAČUNU ZA EL. ENERGIJU",
  "RO": "971632200001111111000"
}
```

Response

Correct

In case the data sent is correct, as in the example above, the user will get a picture:



If the user wants to change the size of the NBS IPS QR received from the system, it is possible to call <https://nbs.rs/QRcode/api/qr/v1/gen/{size}> where instead of {size} the user can enter the desired size of the NBS IPS QR.

For example, the user can call <https://nbs.rs/QRcode/api/qr/v1/gen/500>, where 500 is the size of the image {size} and get the following result:



Incorrect

In case the sent data is incorrect, the user will receive the following:

```
{  
  "s":  
    "code": 500,  
    "desc": "Validation failed."  
}
```

2.2. Method **generate**

URL

<https://nbs.rs/QRcode/api/qr/v1/generate> ili <https://nbs.rs/QRcode/api/qr/v1/generate/{size}>

Localization

It is possible to add a *lang* parameter to the URL that specifies the language / alphabet of the error that will be returned in *response* in the event of a faulty NBS IPS QR. The supported *lang* parameter values:

sr_RS_Latn – Latin

sr_RS – Cyrillic

en – English

If the parameter *lang* is not specified, the default language / alphabet is Latin.

Example: https://nbs.rs/QRcode/api/qr/v1/generate?lang=sr_RS

Description

This method is used to create the NBS IPS QR. In order to use this method, the user must send a *body* (POST) of type text to the aforementioned address.

After processing the text, which represents the data for the formation of the NBS IPS QR, the system returns the response object, i.e. the system provides the user with the following information:

- that the text sent to the system is in accordance with the NBS IPS QR specification or that this is not the case;
- if the text does not comply with the specification, the system provides the user with information about the error detected;
- a base64 encoded image of the NBS IPS QR is sent;
- the original text is sent;
- the system creates and sends a JSON file with data from the sent text.

Request

Example of correct text:

```
{K:PR|V:01|C:1|R:845000000040484987|N:JP EPS BEOGRAD  
BALKANSKA 13||:RSD3596,13|P:MRĐO MAČKATOVIĆ  
ŽUPSKA 13  
BEOGRAD 6|SF:189|S:UPLATA PO RAČUNU ZA EL. ENERGIJU|RO:9716322000011111111000
```

Response

Correct

The system returns object:

```
{
  "s": {
    "code": 0,
    "desc": "OK"
  },
  "t": "K:PR|V:01|C:1|R:845000000040484987|N:JP EPS BEOGRAD\r\nBALKANSKA
13|I:RSD3596,13|P:MRĐO MAČKATOVIĆ\r\nŽUPSKA 13\r\nBEOGRAD 6|SF:189|S:UPLATA PO
RAČUNU ZA EL. ENERGIJU|RO:971632200001111111000",
  "n": {
    "K": "PR",
    "V": "01",
    "C": "1",
    "R": "845000000040484987",
    "N": "JP EPS BEOGRAD\r\nBALKANSKA 13",
    "I": "RSD3596,13",
    "P": "MRĐO MAČKATOVIĆ\r\nŽUPSKA 13\r\nBEOGRAD 6",
    "SF": "189",
    "S": "UPLATA PO RAČUNU ZA EL. ENERGIJU",
    "RO": "971632200001111111000"
  },
  "i":
  "iVBORw0KGgoAAAANSUUhEUgAAAPoAAAD6AQAAAACgl2eQAAADAEIEQVR42u2ZW47bM
AxFpY2I+99FlyJuhCrPpeNJUKBfNfsTj4FxnPNxQVJ8ZZy/X7/GF/gC/xrYY8wTttf0bdvOnnuZ1+su
wPOOGSs/xtz5IYfFMNc3XcCeno9J7JEiPVJdMrxuBU6qSpOZDLZQ7P8BMJd9RppKpju9AHdK
s4oTNOkqT28+DBCd/uf1GdUPA1xbEcvt+ktrfZ7uh4E8rMjMiEWZHRhh24D0D9kjcFXGjPGA7zK
A2oB8QaCmvljom5iLlObeB6ScZSWVf1goVl52+oCxRr4ljevpspszNx3gFbQOwyVmBeUoaktNlm
Uz7ACFG9h5GBk2pKROI3gZs1VUUZR5NIRJrld7bADyjKpZfZ8hydIM4/rHk40BWdPUWjq9MDI
OL4Y0ACBUUsFLmVxOH9TmlNgNqLZJaaLDqMDGI85W0An1Va6W04vJhsDPtJYg0AUTqp6mR
ULCSvuZ8+gLB1mlyKGtI259bJ520AhRyVEptHRg9GA2ZtgNoc0pYCVk7yuFJ6HyC3UNMDn5F
Ndx2iNkCtnXJZqMVB3PWuD0DaDHW9U8VdOQW5jUC6SO1N5nKekKk6P9sALLSoqYMChm
p16HPsbv6fBzSQXjOxznFU6O5hjUCsayYeVi1fUGFP9AFkbslS17/U/w4Bsw2QnU4Vd7ocjR9MhM
vaAE08mr5m1TONhkfjaRdw9fraCqjCszHJPGb3IPQ84NdaRGlcKZ1Oj9d9AF6pKro5wwlUNm9
D0NNAHRiTPDX9C9cRPrMPqAUN5eRoBsFttSppA1Dkil3f62qxIEVjtgEqJHZqOVB7Asq830ms
A6gkppZXRzhep3e2AdeSqPYU2mHS8+G5PoANhaQdIllebgtBUfA9BDYDy2GZFdUGvNeJsA2p
5yDtaf6bCqf3ENm8DXD2n5qChbR17s/Xe7DUAGnni2hrOWqC+N/9NwLmXA2oxTIW00wrki1lln
eXhtU1937o/DVY2YnFaS1Rkl1u8tXcC+dmTaKJM+rH5Z+Dg4DwPf3xa/QCfwG5pspb8FRdF9AAA
AAEIFtkSuQmCC"
}
```

Explanation of the fields in the object shown above that the system sends:

Tag s – contains information on the compliance of the sent text with the NBS IPS QR specification;

Tag i – contains base64 encoded NBS IPS QR image. This tag is contained in the object only when the text is sent in accordance with the specification;

- The generated image is 150x150. If you wish to change the size, add /size to the URL. For example: URL: <https://nbs.rs/QRcode/api/qr/v1/generate/300>

Tag t – contains text sent to the system by the user;

Tag n – contains a JSON file with data from the sent text.

Incorrect

The system returns the object:

```
{
  "s": {
    "code": 620,
    "desc": "String cannot end with | character."
  },
  "t": "K:PR|V:01|C:1|I:RSD3596,13|R:845000000040484987|P:1dsda89|S:UPLATA PO RAČUNU
ZA EL. ENERGIJU|N:dsadsadsa|SF:189|RO:00dadss|",
  "e": [
    "Text cannot end with | character."
  ]
}
```

The object that the system returns after receiving invalid text consists of the following tags:

Tag s – contains information about compliance of the sent text with the NBS IPS QR specification;

Tag t – contains text sent to the system by the user;

Tag e – contains more detailed information about errors within the sent text.

2.3. Method **validate**

URL

<https://nbs.rs/QRcode/api/qr/v1/validate>

Localization

It is possible to add a *lang* parameter to the URL that specifies the language / alphabet of the error that will be returned in the event of a faulty IPS QR code (hereinafter: IPS QR). The supported *lang* parameter values::

sr_RS_Latn – Latin

sr_RS – Cyrillic

en – English

If the parameter *lang* is not specified, the default language / alphabet is Latin.

Example: https://nbs.rs/QRcode/api/qr/v1/validate?lang=sr_RS

Description

This method is used to check the compliance of the IPS QR with the technical specification. This method can be used to check the correctness of the NBS IPS QR and the correctness of two types of the IPS QR used for payment at the point of sale. These are the codes with identification code PT and EK in the issued specification.

Text type *body* (POST) is sent. The system responds to this parameter with a response object.

Request

Example of correct text:

```
K:PR|V:01|C:1|R:845000000040484987|N:JP EPS BEOGRAD  
BALKANSKA 13||:RSD3596,13|P:MRĐO MAČKATOVIĆ  
ŽUPSKA 13  
BEOGRAD 6|SF:189|S:UPLATA PO RAČUNU ZA EL. ENERGIJU|RO:971632200001111111000
```

Response

Correct

The system returns a *response* object:

```
{
  "s": {
    "code": 0,
    "desc": "OK"
  },
  "t": "K:PR|V:01|C:1|R:845000000040484987|N:JP EPS BEOGRAD\r\nBALKANSKA
13|I:RSD3596,13|P:MRĐO MAČKATOVIĆ\r\nŽUPSKA 13\r\nBEOGRAD 6|SF:189|S:UPLATA PO
RAČUNU ZA EL. ENERGIJU|RO:971632200001111111000",
  "n": {
    "K": "PR",
    "V": "01",
    "C": "1",
    "R": "845000000040484987",
    "N": "JP EPS BEOGRAD\r\nBALKANSKA 13",
    "I": "RSD3596,13",
    "P": "MRĐO MAČKATOVIĆ\r\nŽUPSKA 13\r\nBEOGRAD 6",
    "SF": "189",
    "S": "UPLATA PO RAČUNU ZA EL. ENERGIJU",
    "RO": "971632200001111111000"
  }
}
```

The object that the system returns after receiving the correct text consists of the following tags:

Tag s – contains information about the compliance of the sent text with the specification;

Tag t – contains text sent to the system by the user;

Tag n – contains a JSON file with data from the sent text.

Incorrect

```
{
  "s": {
    "code": 608,
    "desc": "Invalid field format "
  },
  "t": "K:PR|V:01|C:1|R:845000000040484987|N:JP EPS BEOGRAD\r\nBALKANSKA
13|I:RSD3596,13|P:MRĐO MAČKATOVIĆ\r\nŽUPSKA 13\r\nBEOGRAD 6|SF:189|S:UPLATA PO
RAČUNU ZA EL. ENERGIJU|RO:97632200001111111000\r\n",
  "e": [
```

```
"Only numbers and letters are correct976322000011111111000\r\n",  
"The reference number is not according to model97 976322000011111111000\r\n"  
]  
}
```

The object that the system returns after receiving invalid text consists of the following tags:

Tag *s* – contains information about compliance of the sent text with the specification;

Tag *t* – contains text sent to the system by the user;

Tag *e* – contains more detailed information about errors within the sent text.

2.4. Method **upload**

URL

<https://nbs.rs/QRcode/api/qr/v1/upload>

Localization

It is possible to add a *lang* parameter to the URL that specifies the language / alphabet of the error that will be returned in *response* in the event of an invalid IPS QR. The supported *lang* parameter values:

sr_RS_Latn – Latin

sr_RS – Cyrillic

en – English

If the parameter *lang* is not specified, the default language / alphabet is Latin.

Example: https://nbs.rs/QRcode/api/qr/v1/upload?lang=sr_RS

Description

This method is used to check the compliance of the IPS QR with the technical specification. A file is sent to the aforementioned address – more precisely a png or jpeg image of the IPS QR (NBS IPS QR or IPS QR which is used for instant payment on merchants' points of sale).

The system responds to the aforementioned parameter with a response object.

Request

As a *body*, a form-data is sent in which the *key* is a file, and the value is an image of the IPS QR code.

Params ● Authorization Headers (10) **Body ●** Pre-request Script Tests Settings

● none ● **form-data** ● x-www-form-urlencoded ● raw ● binary ● GraphQL

KEY	VALUE
<input checked="" type="checkbox"/> file	4.3.png X

Example of a valid file (png or jpeg image of IPS QR):



Correct

Ispravno

The system returns the object:

```
{
  "s": {
    "code": 0,
    "desc": "OK"
  },
  "t": "K:PR|V:0|C:1|R:845000000040484987|N:JP EPS BEOGRAD\r\nBALKANSKA
13|I:RSD3596,13|P:MRĐO MAČKATOVIĆ\r\nŽUPSKA 13\r\nBEOGRAD 6|SF:189|S:UPLATA PO
RAČUNU ZA EL. ENERGIJU|RO:971632200001111111000",
  "n": {
    "K": "PR",
    "V": "0",
    "C": "1",
    "R": "845000000040484987",
    "N": "JP EPS BEOGRAD\r\nBALKANSKA 13",
    "I": "RSD3596,13",
    "P": "MRĐO MAČKATOVIĆ\r\nŽUPSKA 13\r\nBEOGRAD 6",
    "SF": "189",
    "S": "UPLATA PO RAČUNU ZA EL. ENERGIJU",
    "RO": "971632200001111111000"
  }
}
```

The object that the system returns after receiving the correct file consists of the following tags:

Tag s – contains information about compliance of the text from the sent file with the specification;

Tag t – contains text from the file (IPS QR) sent to the system by the user;

Tag n – contains a JSON file with data from the mentioned text.

Incorrect

The system returns the object:

```
{
  "s": {
    "code": 608,
    "desc": "Invalid field format"
  },
  "t": "K:PR|V:01|C:1|R:845000000040484987|N:JP EPS BEOGRAD\r\nBALKANSKA
13|I:RSD359613|P:MRĐO MAČKATOVIĆ\r\nŽUPSKA 13\r\nBEOGRAD 6|SF:189|S:UPLATA PO
RAČUNU ZA EL. ENERGIJU|RO:971632200001111111000",
  "e": [
    "Invalid format of tag I. Entered: 'RSD359613' "
  ]
}
```

The object that the system returns after receiving invalid file consists of the following tags:

Tag s – contains information about the compliance of the text from sent file with the specification;

Tag t – contains text form file (IPS QR) sent to the system by the user;

Tag e – contains more detailed information about errors within the sent file.

Important notes for Service users

In order to use the NBS IPS QR codes and the Service properly, we especially note the following:

Payment by scanning the NBS IPS QR code allows the payer only easier preparation of the payment order – by scanning this code via the m-banking application the data is automatically filled in the payment order and the payer may change certain data (e.g. amount).

Such payments are absolutely not instant payments at merchants' points of sale which are executed in accordance with regulations via a special code marked IPS QR.

For instant payments at the point of sale, the merchant must cooperate with one of the acquiring banks to be able to generate IPS QR codes (**NOT** the NBS IPS QR code) with the appropriate data and in accordance with security measures established by the acquiring bank.

Recommendation is for data on the payer to be left out of the NBS IPS QR code if the issuer of the bill, as the payee, records the paid obligation of the service consumer to which the bill/invoice refers according to the reference credit number.

Data on the payer are not only optional, but may also be changed by the bank in line with the relevant regulation. In that case, the bank will not take into consideration the data on the payer from the NBS IPS QR code, as the payer will be the account owner which in effect executes the payment. When tag "P" is not used, the payee must take care not to enter |P:| , but to leave the tag entirely out.