Direction Générale des Impôts
Ministère de l'Economie et des Finances
RÉPUBLIQUE DU BÉNIN

ELECTRONIC MACHINES BILLING CERTIFIED

API SPECIFICATION FOR e-MCF

Date	Version	By	Description
01/15/2021 1.0		DGI	First version

INTRODUCTION

As part of the standardized invoice reform, taxpayers must issue a standardized invoice using certified electronic invoicing machines (MECeF).

Taxpayers who own their business invoicing system (SFE) can connect their software to the invoicing module (MCF) and produce standardized invoice, implementing a standardized protocol that allows the exchange of data between the SFE and the MCF . In this process, the SFE sends invoice data to the MCF and the MCF responds with security elements (MECeF/DGI Code among others), which are necessary to produce standardized invoice.

The DGI is now introducing another option for taxpayers who use their own SFE – the e-MCF (dematerialized control module). The e-MCF is a software implementation of the MCF on the DGI side. The SFE can communicate with the e-MCF via the application programming interface (API) to obtain security features and produce standardized invoice without the need for the physical machine.

This document is aimed at taxpayers who wish to use e-MCF and describes the API that is available on the e-MCF side.

GENERAL DESCRIPTION OF THE API

An API is provided by the DGI with the following general description:

API Name	Current version	Used by	Description
e-MCF-API	1.0	Taxpayers who have approved their SFE to connect to the e-MCF	The taxpayer can use this API in order to submit data from invoice to the DGI and obtain the security elements necessary to produce standardized invoice

PRE-REQUIREMENTS

To access the API, the following conditions must be met:

1. **The taxpayer is registered by the DGI as an e-MCF user**

The taxpayer must contact the DGI in order to obtain and submit the "request of use of e-MCF". The DGI will activate the taxpayer's account and create the requested number of e-MCFs (one e-MCF for each of the taxpayer's stores). The taxpayer will automatically receive an email with the settings to log into the system. After successful login, the taxpayer is presented with the e-MCF management interface.

2. **The DGI has activated the e-MCF**

Once e-MCF is activated by the DGI, it can be used to record standardized invoices.

3. **The DGI has created security tokens that authorize SFE to access the API**

In order to authorize the SFE to access the API, the taxpayer must obtain a token for each e-MCF. The tokens are created by the DGI.

NOTE: Keep the tokens secret! Use them only to configure your SFE to access the API. Tokens should not be shared or saved anywhere unauthorized personnel have access.

4. **The taxpayer has an Internet connection and can access the** e-MCF server

With the token ready, the taxpayer's SFE can begin communicating with the e-MCF in order to record standardized invoices.

DATA FORMAT

API supports JSON data format, both in requests and responses.

Request headers are defined as follows:

Request header		Description
content-type	Application/json	Request contains JSON data
accept	value application/json	The response must be in JSON format

AUTHENTICATION

Authentication is provided through a JWT token which must be included in the request header.

Request header	Value	Description
Authorization	Bearer <token>	<token> has the value of the token provided by the e-MCF management system

Unauthorized requests will return HTTP status code **401 Unauthorized.**

API METHODS

The API is RESTful and uses GET, POST and PUT methods.

Any POST request must contain the content body, otherwise API will return HTTP status code **400 Bad Request.**

API DESCRIPTION

The API has two parts:

1. Billing API
2. Information API

The Invoicing API is used to register new standardized invoices and is based on four methods:
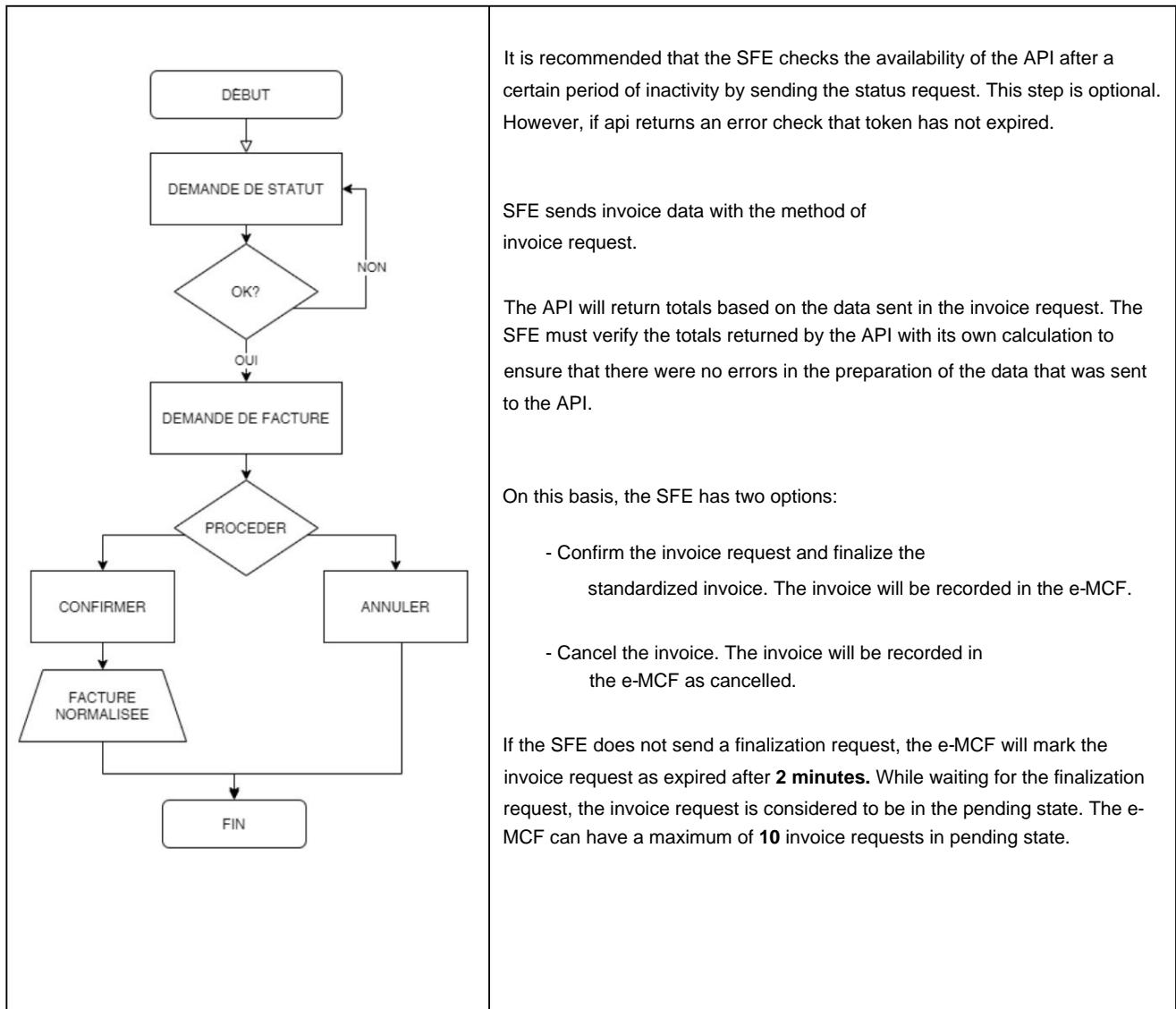
BILLING API		
Kind	Method	Description
GET	Request Status	Check API status
POST	Request Invoice	Submit invoice data and get amounts calculated by the e-MCF
PUT	Finalization request	Finalize the invoice: Option 1 – confirm invoice This option is used if the SFE wants to finalize the invoice. The response will contain security elements based on which the SFE can issue standardized invoice Option 2 – cancel the invoice This option is used if the SFE wants to cancel the invoice. The response does not contain the MECeF/DGI Code and the SFE cannot issue a standardized invoice
GET /{uid}	Request details on the pending invoice	This method is used to verify data on the invoice that is not yet finalized (invoice request is issued but finalization request is still not issued), in case SFE wants to verify the content that has been sent using the post.

The Information API is used to obtain information about e-MCFs, tax groups, available invoice types and available payment types and is based on four
methods :

INFORMATION API		
Kind	Method	Description
GET /status	Information on e-MCFs	Check API status and get list of all e-MCFs
GET /taxGroups	Information on tax groups	Obtain information on available tax groups and their values
GET /invoiceTypes	Information on invoice types	Get information about available invoice types
GET /paymentTypes	Information about payment types	Get information on available payment types

WORKFLOW FOR RECORDING
THE NEW STANDARDIZED INVOICE

The SFE operation workflow that is used during standard invoice registration is shown in the following diagram:

DÉBUT → **DEMANDE DE STATUT** → **OK?** (NON loops back / OUI continues) → **DEMANDE DE FACTURE** → **PROCEDER** → **CONFIRMER** / **ANNULER** → **FACTURE NORMALISEE** → **FIN**	It is recommended that the SFE checks the availability of the API after a certain period of inactivity by sending the status request. This step is optional. However, if api returns an error check that token has not expired.

It is recommended that the SFE checks the availability of the API after a certain period of inactivity by sending the status request. This step is optional. However, if api returns an error check that token has not expired.

SFE sends invoice data with the method of invoice request.

The API will return totals based on the data sent in the invoice request. The SFE must verify the totals returned by the API with its own calculation to ensure that there were no errors in the preparation of the data that was sent to the API.

On this basis, the SFE has two options:

- Confirm the invoice request and finalize the standardized invoice. The invoice will be recorded in the e-MCF.

- Cancel the invoice. The invoice will be recorded in the e-MCF as cancelled.

If the SFE does not send a finalization request, the e-MCF will mark the invoice request as expired after **2 minutes.** While waiting for the finalization request, the invoice request is considered to be in the pending state. The e-MCF can have a maximum of **10** invoice requests in pending state.

API URL

The billing API is available at the following address:

Server	{API_BILLING_URL}
PRODUCTION	https://sygmef.impots.bj/emcf/api/invoice
TEST	https://developper.impots.bj/sygmef-emcf/api/invoice

The information API is available at the following address:

Server	{API_INFORMATION_URL}
PRODUCTION	https://sygmef.impots.bj/emcf/api/info
TEST	https://developper.impots.bj/sygmef-emcf/api/info

BILLING API METHODS

1.1 STATUS REQUEST

Status request is used to get status of API, token and pending invoices.

- **• URL**   **{API_BILLING_URL}/**

- **• Method:**   GET

- **• URL Params:**   NONE

- **• Success Response (HTTP code 200): JSON(StatusResponseDto)**

The **StatusResponseDto** object is defined as:

Field	Kind	Description
status	Boolean	true if the API is operational, false Otherwise
version	ifu	API version
thong	Nim	Taxpayer IFU
thong	String	e-MCF NIM
tokenValid	Datetime	validity of the API key used
serverDateTime	Datetime	current API server date and time
pendingRequestsCount Integer		Number of pending invoice requests (requests that are not finalized)
pendingRequestsList	**Array<PendingRequestDto>** List of pending invoice requests	

The **PendingRequestDto** object is defined as:

Date field	Kind	Description
	Datetime	Date and time the invoice request was received
uid	String	Invoice request UID

Example :

Request :

**GET /api/invoice HTTP/1.1 Host:
XXXXXXXXXXX**
Authorization: Bearer XXXXXXXXXXX

Answer :

```
{
    "status": true,
    "version": "1.0",
    "ifu": "99999000000001",
    "nime": "XX01000001",
    "tokenValid": "2020-11-28T00:00:00+01:00",
    "serverDateTime": "2020-11-21T17:25:14.7179651+01:00",
    "pendingRequestsCount": 4,
    "pendingRequestsList": [
        {
            "date": "2020-11-20T21:45:56.523+01:00", "uid":
            "437261A6-41BD-4D7B-B61B-E60C2D8089AA"
        },
        {
            "date": "2020-11-20T21:46:49.207+01:00", "uid":
            "313AE8C2-1EAC-4DE9-AF40-7A0240599114"
        },
        {
            "date": "2020-11-20T21:47:41.407+01:00", "uid":
            "C562ADCF-BCF5-4592-A95F-5A5617C66FD8"
        },
        {
            "date": "2020-11-20T21:48:17.78+01:00", "uid":
            "83221CFF-C2C6-46B2-A1FD-35BDD0553A27"
        }
    ]
}
```

1.2 INVOICE REQUEST

The invoice request is used to send invoice data to the e-MCF and obtain the totals calculated by the e-MCF.

• **URL**   **{API_BILLING_URL}/**

• **Method:**   POST

• **Body content:**   **JSON(InvoiceRequestDataDto)**

• **Success Response (HTTP code 200): JSON(InvoiceResponseDataDto)**

The **InvoiceRequestDataDto** object is defined as:

Field Field type ifu string		Length Optional 13		Description	Example
			No	Seller's IFU	999990000000 1
aib	AibGroupTypeEnum 1		Yes	AIB tax type: - A – in case of AIB 1% - B – in case of AIB 5%	HAS

kind	InvoiceTypeEnum 2		No	Type of invoice:
				 - FV – Sales invoice
				 - EV – Sales invoice
				   for export
				 - FA – Credit note
				 - EA – Invoice of having to
				   export
					FV

items	Array<ItemDto>		No	List of items on the invoice	
customer	ClientDto		Yes	Customer Details (Buyer)	
operator OperatorDto			No	Operator details POS	
payment Array<PaymentDto>			Yes	Payment type details. If the field is not present, payment in CASH is considered by default	
reference string		24	No for FA invoice types, EA	Invoice reference original in case of credit invoice (FA or EA) The content is 24 characters of Code MECeF/DGI of the original invoice	ABCDABCDABCD ABCDABCDABCD

The **ClientDto** object is defined as:

ifu field	Field type Length Optional Description string string string string				Example
		13	Yes	Customer IFU	9999900000002
name			Yes	Client name	SUPERMARHCE SARL
contact			Yes	Customer Contact	7783727, info@test.com
address			Yes	Customer Address	Boulevard 23, Cotonou

The **OperatorDto** object is defined as:

ID field	Field type Length Optional Description string				Example
			Yes	Operator identification	01
name	string		No	Operator name	Jacques

The **PaymentDto** object is defined as:

Field Field type		Length Optional Description Description of			Example
name	**PaymentTypeEnum**		No	payment. Could be one of the elements following: • SPECIES • PAYMENT • BANK CARD • MOBILE MONEY • CHECKS • CREDIT • OTHER	SPECIES
amount integer			No	Name	1240

The **ItemDto** object is defined as:

Field	Field type	Long smell	Optionnel	Description	Example
coded	string		Yes	Item code	92891
name	string		No	Article name	Milk
price	integer		No	Unit price	1200
quantity	decimal		No	Quantity	12,250
taxGroup	**TaxGroupType Enum**	1	No	Tax group. One of the following: A B C D E F	HAS
taxSpecific	integer		Yes	Value of the specific tax for the entire quantity (not per unit of the item)	230
originalPrice	integer		Yes	Original price in case of price change	2400
priceModification	string		Yes	Description of the price change in case there is a price change	Discount 50%

10

The **InvoiceResponseDataDto** object is defined as:

Field	Field type	Length	Description	Example
uid	string	36	Transaction identification. This value is used in finalization requests.	ac33f8fe-9735-4ed6-a9c3-df58a908ccd3
your	integer		Value of taxation group A (in %)	0
tb	integer		Value of taxation group B (in %)	18
tc	integer		Value of taxation group C (in %)	0
td	integer		Value of tax group D (in %)	18
taa	integer		Total amount for group A	100
tab	integer		Total amount for group B	0
tac	integer		Total amount for group C	0
tad	integer		Total amount for group D	0
tae	integer		Total amount for group E	0
taf	integer		Total amount for group F	0
hab	integer		Amount excluding tax for group B	0
had	integer		Amount excluding tax for group D	0
vab	integer		VAT amount for group B	0
vad	integer		VAT amount for group D	0
aib	integer		AIB amount	0
ts	integer		Amount of specific tax	0
total	errorCode		Total amount on invoice	100
string			Optional: error code in case of error. uid is zero in this case	1
errorDesc	string		Optional: description of errors in case of error. Uid is null in this case	The number maximum of invoices in waiting is exceeds

Example :

Request :

**POST /api/invoice HTTP/1.1 Host:
XXXXXXXXXXX
Authorization: Bearer XXXXXXXXXXX
Content -Type: application/json
Content-Length: 765**

```
{
  "ifu" :"9999900000001"          ,
  "type" :"FV"     ,
  "items":

    [ { "name" :"Orange juice" ,
        "price" :1800     ,
        "quantity" : 2    ,
        "taxGroup" :"B"


    },{
        "name" :"Milk 1/1 EX"       ,
        "price" :450    ,
        "quantity" : 3     ,
        "taxGroup" :"A" } ],



  "client":
    { "contact" :"45661122"       ,
      "ifu " :"99999000000002",
      "name" : "Customer name",
      "address" :"Rue d'ananas 23" },


  "operator":
    { "id" :"",
      "name" :"Jacques" },


  "payment":[ {

      "name" : "SPECIES",
      "amount" :4950

    }


}]}
```

Answer :

{

   "uid": "ac33f8fe-9735-4ed6-a9c3-df58a908ccd3", "ta": 0,

   "tb": 18,

   "tc": 0,

   "td": 18,

   "taa":

   1350, "tab":

   3600, "tac":

   0, "tad":

   0, "tae":

   0, "taf":

   0, "hab":

   3051, "had":

   0, "vab":

   549, "vad":

   0, "total":

   4950, "aib": 0,

   "ts": 0

}

1.3 REQUEST FOR FINALIZATION

Confirm or cancel the invoice request.

• **URL**	**{API_BILLING_URL}/{UID}/{ACTION}**	
• **Method:**	POST	
• **URL Params**	{UID}, {ACTION}	
• **Success Response (HTTP code 200):**	**JSON(SecurityElementsDto)**	

Description of URL parameters:

Field Field type		Length Optional Description			Example
UID	string	36	No	UID that was received in the response **(InvoiceResponseDataDto)** of the invoice request	e5af2ff9-0ac8-4924-b8b7-cc9da3a17db8
ACTION	string		No	Maybe: - confirm – confirm the invoice request - cancel – cancel the invoice request	confirm

The **SecurityElementsDto** object is defined as:

Field	Field type	Length Description		Example
dateTime	string	19	Invoice date and time	11/21/2020 2:44:23 PM
qrCode	string	66	QR code content. The field is empty if the invoice is canceled.	F;….
codeMECeFDGI	string	29	MECeF/DGI code. The field is empty if the invoice is canceled.	UJKI-….
counters	thong		Counters	23/56 FV
nim	string	10	e-MCF NIM	XX01000001
errorCode	thong		Optional: error code in case of error	11
errorDesc	string		Optional: description of errors in case of error	The invoice does not exist or it is already finalized / canceled

Example :

Request :

PUT /api/invoice/ac33f8fe-9735-4ed6-a9c3-df58a908ccd3/confirm HTTP/1.1 Host: XXXXXXXXXXX

Authorization: Bearer XXXXXXXXXXX

Answer :

{
   "dateTime": "11/23/2020 1:17:08 PM",
   "qrCode" : " F;IN01000005 ; -FEKJ" , "counters": "64/64 FV", "nim": "IN01000005"

}

1.4 REQUEST FOR DETAILS ON PENDING INVOICE

Confirm or cancel the invoice request.

- **URL**   **{API_BILLING_URL}/{UID}**

- **Method:**   GET

- **URL Params**   {UID}

- **Success Response (HTTP code 200):**   **JSON(InvoiceDetailsDto)**

Description of URL parameters:

Field Field type		Length Optional Description			Example
UID	string	36	No	UID that was received in the response **(InvoiceResponseDataDto)** of the invoice request	e5af2ff9-0ac8-4924-b8b7-cc9da3a17db8

The **InvoiceDetailsDto** object is defined as:

Field	Field type	Length Optional		Description	Example
ifu	string	13	No	Seller's IFU	9999900000001
aib	AibGroupTypeEnum 1		Yes	AIB tax type: • A – in case of AIB 1% • B – in case of AIB 5%	HAS
kind	InvoiceTypeEnum	2	No	Type of invoice: 1. FV – Invoice of sale 2. EV – Invoice export sales 3. FA – Credit note 4. EA – Export credit invoice	FV
items	Array<ItemDto>		No	List of articles on the Invoice	

customer	ClientDto		Yes	Customer Details (Buyer)	
operator	OperatorDto		No	Operator details POS	
payment Array<PaymentDto>			Yes	Payment type details. If the field is not present, the payment in CASH is considered by default	
reference string			No for FA invoice types, EA	SEO at original invoice in case of FA and EA	TE01000123-433
errorCode string			Optional : coded error in error case		
errorDesc string			Optional : description errors in case error		

The **ClientDto, OperatorDto, PaymentDto, ItemDto** objects are already defined in the **InvoiceRequestDto** section.

Example :

Request :

GET /api/invoice/ac33f8fe-9735-4ed6-a9c3-df58a908ccd3 HTTP/1.1 Host: XXXXXXXXXXX

Authorization: Bearer XXXXXXXXXXX

Answer :

```
{ "ifu":"9999900000001",
  "type":"FV",
  "items":

    [ { "name":" Orange juice",
        "price":1800,
        "quantity":2,
        "taxGroup": "B" },


      { "name":"Milk 1/1 EX",
        "price":450,
        "quantity":3,
        "taxGroup":"A" } ],


  "client":
    { "contact":" 45661122",
    "ifu":"99999000000002",
    "name":" Customer name",
    "address":"Rue d'ananas 23"

  }, "operator":
    { "id":"",
    "name":"Jacques" },

  "payment":

    [ { "name":"CASH",
        "amount":4950
    }

]}
```

INFORMATION API METHODS

2.1 INFORMATION ON E-MCFs

Status request is used to get status of API, token and pending invoices.

• **URL**	**{API_INFORMATION_URL}/status**
• **Method:**	GET
• **URL Params:**	NONE
• **Success Response (HTTP code 200):**	**JSON(InfoResponseDto)**

The **InfoResponseDto** object is defined as:

Field	Kind	Description
status	Boolean	true if the API is operational, false Otherwise
version	String	API version
ifu	String	Taxpayer IFU
nim	String	e-MCF NIM whose token was used
tokenValid	Datetime	validity of the API key used
serverDateTime	Datetime	current API server date and time
emcfList	**Array<EmcfInfoDto>**	List of invoice requests in waiting

The **EmcfInfoDto** object is defined as:

Field	Kind	Description
nim	String	e-MCF NIM
status	String	Status of the e-MCF. Maybe : • Registered – if the e-MCF is not activated by the DGI • Active – if e-MCF is active (can register new invoices) • Disabled – if e-MCF is disabled (cannot record new invoices)
shopName String		Name of point of sale
address1	String	Street
address2	String	Location Description
address3	String	City
contact1	String	Phone
contact2	String	E-mail
contact3	String	Additional phone/email

Example :

Request :

GET /api/info/status HTTP/1.1 Host:
XXXXXXXXXXX
Authorization: Bearer XXXXXXXXXX

Answer :

{
    "status": true,
    "version": "1.0", "ifu":
"9999900000001", "nim":
"XX01000070", "tokenValid":
"2021-01-31T00:00:00+01:00", "serverDateTime":
"2021-01-05T21:26:18.9775221+01:00", "emcfList": [

        {
            "nim": "XX01000070", "status":
            "Active", "shopName": "TEST
            #70", "address1": "Boulevard 23",
            "address2": null, "address3": "Cotonou", "
            contact1": "12345678",
            "contact2": null, "contact3": null

        },
        {
            "nim": "XX01000071",
            "status": "Disabled",
            "shopName": "TEST #70",
            "address1": "Boulevard 23",
            "address2": null,
            "address3": "Cotonou", "
            contact1": "12345678",
            "contact2": null,
            "contact3": null
        }
    ]
}

2.2 INFORMATION ON TAX GROUPS

Status request is used to get status of API, token and pending invoices.

- **URL**   {API_INFORMATION_URL}/taxGroups

- **Method:**   GET

- **URL Params:**   NONE

- **Success Response (HTTP code 200):**   JSON(TaxGroupsDto)

The **TaxGroupsDto** object is defined as:

Field	Kind	Description	Value
has	Integer	Value of tax group A	0
b	Integer	Value of tax group B	18
vs	Integer	Value of tax group C	0
d	Integer	Value of tax group D	18
e	Integer	Value of tax group E	0
f	Integer	Value of tax group F	0
aibA	Integer	Value of AIB A tax group	1
aibB	Integer	Value of AIB B tax group	5

Example :

Request :

GET /api/info/taxGroups HTTP/1.1
Host: XXXXXXXXXXX
Authorization: Bearer XXXXXXXXXXX

Answer :

```
{
    "a": 0,
    "b": 18,
    "c": 0,
    "d": 18,
    "e": 0,
    "f": 0,
    "aibA": 1,
    "aibB": 5
}
```

2.3 INFORMATION ON INVOICE TYPES

Status request is used to get status of API, token and pending invoices.

• URL	**{API_INFORMATION_URL}/invoiceTypes**
• Method:	GET
• URL Params:	NONE
• Success Response (HTTP code 200):	**JSON(Array<InvoiceTypeDto>)**

The **InvoiceTypeDto** object is defined as:

Field	Type	Description	Value
kind	string	Label for invoice type	FV
description	string	Description of the standard invoice	sales receipt

Example :

Request :

GET /api/info/invoiceTypes HTTP/1.1
Host: XXXXXXXXXXX
Authorization: Bearer XXXXXXXXXXX

Answer :

```
[
    {
        "type": "FV",
        "description": "Sales invoice"
    },
    {
        "type": "FA",
        "description": "Credit invoice"
    },
    {
        "type": "EV",
        "description": "Export sales invoice"
    },
    {
        "type": "EA",
        "description": "Export credit invoice"
    }
]
```

2.4 INFORMATION ON PAYMENT TYPES

Status request is used to get status of API, token and pending invoices.

• URL	**{API_INFORMATION_URL}/paymentTypes**
• Method:	GET
• URL Params:	NONE

• Success Response (HTTP code 200): JSON(Array<PaymentTypeDto>)

The **PaymentTypeDto** object is defined as:

Field	Type	Description	Value
kind	string	Label for CASH payment type	
description	string	Description of payment type	SPECIES

Example :

Request :

**GET /api/info/paymentTypes HTTP/1.1 Host:
XXXXXXXXXXX**
Authorization: Bearer XXXXXXXXXXX

Answer : [

```
    {
        "type": "SPECIES",
        "description": "SPECIES"
    },
    {
        "type": "CHECKS",
        "description": "CHECKS"
    },
    {
        "type": "MOBILEMONEY",
        "description": "MOBILE MONEY"
    },
    {
        "type": "CARTEBANCAIRE",
        "description": "BANK CARD"
    },
    {
        "type": "TRANSFER",
        "description": "TRANSFER"
    },
    {
        "type": "CREDIT",
        "description": "CREDIT"
    },
    {
        "type": "OTHER",
        "description": "OTHER"
    }
]
```

APPENDIX: LIST OF ERRORS

errorCode	errorDesc
1	The maximum number of pending invoices has been exceeded
3	Invoice type is invalid
4	The original invoice reference is missing
5	The original invoice reference does not contain 24 characters
6	AIB value is invalid
7	Payment type is invalid
8	The invoice must contain the items
9	The item level tax group is invalid
10	The original invoice reference cannot be validated, please try again later
11	The original invoice reference is invalid (the original invoice could not be found)
12	The original invoice reference is invalid (the amount on the invoice has exceeded the amount on the original invoice)
20	The invoice does not exist or it is already finalized / canceled
99	Error processing request