



openFinance API Framework Implementation Guidelines for Extended Services

Extended Account Information Services

Version 2.0

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1 Introduction

1.1 From Core XS2A Interface to openFinance API

With [PSD2] the European Union has published a directive on payment services in the internal market. Among others [PSD2] contains regulations on services to be operated by so called Third Party Payment Service Providers (TPP) on behalf of a Payment Service User (PSU). These services are

- Payment Initiation Service (PIS) to be operated by a Payment Initiation Service Provider (PISP) TPP as defined by article 66 of [PSD2],
- Account Information Service (AIS) to be operated by an Account Information Service Provider (AISP) TPP as defined by article 67 of [PSD2], and
- Confirmation on the Availability of Funds Service (FCS) to be used by a Payment Instrument Issuing Service Provider (PIISP) TPP as defined by article 65 of [PSD2].

To implement these services (subject to PSU consent) a TPP needs to access the account of the PSU. The account is managed by another PSP called the Account Servicing Payment Service Provider (ASPSP). To support the TPP in accessing the accounts managed by an ASPSP, each ASPSP has to provide an "access to account interface" (XS2A interface). Such an interface has been defined in the Berlin Group NextGenPSD2 XS2A Framework.

This XS2A Framework is now extended to premium services. This interface is addressed in the following as **openFinance API**. This openFinance API differs from the XS2A interface in several dimensions:

- The extended services might not rely anymore solely on PSD2.
- Other important regulatory frameworks which apply are e.g. GDPR.
- The openFinance API can address different types of **API Clients** as access clients, e.g. TPPs regulated by an NCA according to PSD2, or corporates not regulated by an NCA.
- The extended services might require contracts between the access client and the ASPSP.
- While the client identification at the openFinance API can still be based on eIDAS certificates, they do not need to be necessarily PSD2 compliant eIDAS certificates.
- The extended services might require e.g. the direct involvement of the access client's bank for KYC processes.

Note: The notions of API Client and ASPSP are used because of the technical standardisation perspective of the openFinance API. These terms are analogous to "asset broker" and "asset holder" resp. in the work of the ERPB on a SEPA API access scheme.



Note: In implementations, the API services of several ASPSPs might be provided on an aggregation platform. Such platforms will be addressed in the openFinance API Framework as "API provider".

The following account access methods are covered by this framework:

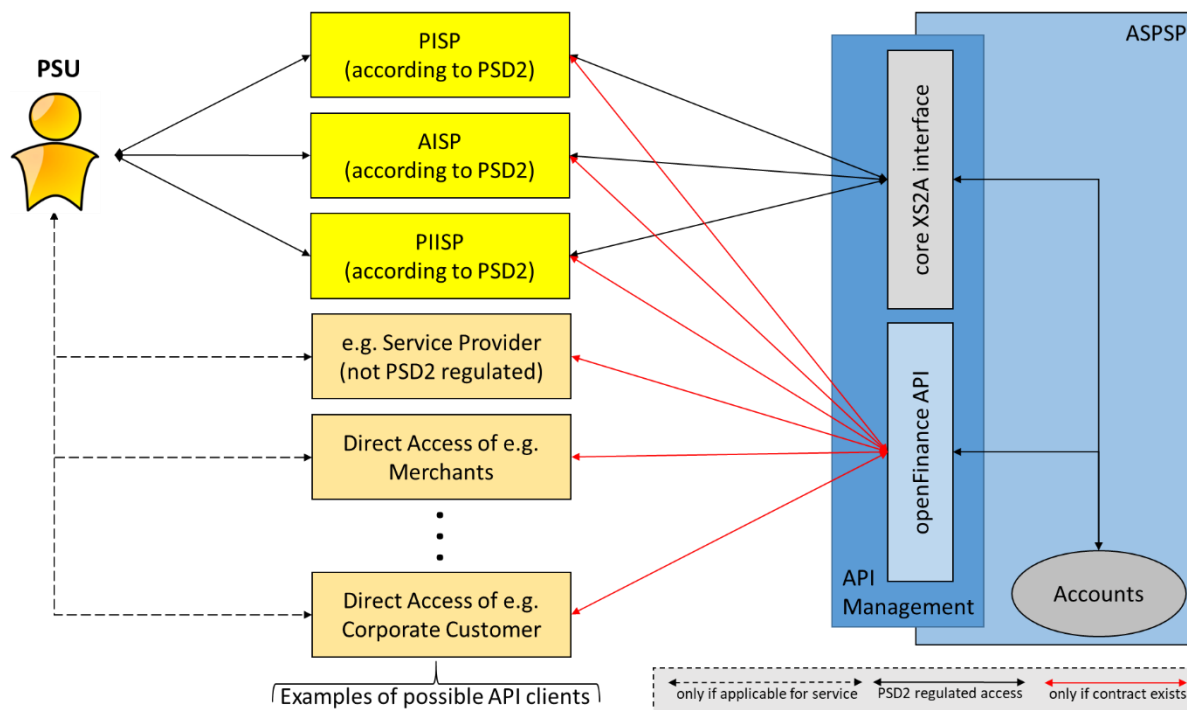


Figure 1: Core XS2A interface and openFinance API

The ASPSP may restrict the access to the services offered at its openFinance API and require dedicated onboarding. Details of the onboarding process are described in a dedicated implementation guidelines document [oFA-IG-ADM].

1.2 Extended Account Information Services

The core XS2A Interface as introduced above is already supporting Account Information Services (AIS) for **current accounts** and **card reconciliation accounts**. These services follow the functionality of online channels of the related ASPSP: Via the services, information on accounts, balances and transactions can be requested for the supported account types. Each request must refer to an underlying consent from the PSU that grants the TPP access to the requested information. Consent follows the process as described in [oFA-CO].

For the envisaged Extended Services, the account information function of the openFinance API will go beyond account types defined by the core XS2A Interface. As new entities as a basis of information, the following are supported:

- single cards (in contrast to card reconciliation accounts)
- savings accounts
- loan accounts
- securities accounts.

Note: Even if introduced for TPP related scenarios, the related premium payment services and related technical endpoints could also be offered in a direct access scenario e.g. for corporates of an ASPSP to request information on their corresponding accounts / cards directly.

1.3 Document Structure

This document specifies the Extended Account Information Services in detail.

Section 3 is providing specific, but still abstract information on the application layer of this service like service API access methods or service specific error codes.

Section 4 defines the API for Extended Account Services in detail.

1.4 Document History

Version	Change/Note	Approved
2.0	Initial version of extended AIS functions migrated from version 1.3.x. The consent handling has been removed from the account related topics and been integrated in [oFA-CO]. Within the actual account endpoints, only very minor changes have been applied like the length restriction to certain strings like consentId to Max70Text in the context of restricting all resource ids in the API Framework to Max70Text. Also, a short chapter 12 on operational rules have been added listing the few differences to the related operational rules of AIS in a PSD2 compliance context. Further, all resource ids have been replaced by UUID format in examples, since this is the recommended best practice.	2024-03-01

2 Operational Rules

As a general approach, all service descriptions within version 2 of the openFinance Framework come as a triple of documents defining the service:

- An operational rules document, which explains the business processes and business requirements for the underlying service.
- An implementation guideline document, defining the essential API messaging and flows.
- A yaml file with all messaging details.

For details, see [oFA-GuideV2].

For the Extended Account Information Services, this approach is not fully followed through:

While the document at hand constitutes the implementation guidelines for the Extended Account Information Services and a corresponding yaml file is to be published, no dedicated operational rules document for the Extended Account Information Services will be published.

In general, the operational rules for the (compliance) Account Information Services as defined in [oFA-OR-Com] also apply to the Extended Account Information Services. In this chapter, deviations from these rules as defined in [oFA-OR-Com] are documented. Currently, the only difference to [oFA-OR-Com] is that restrictions to the validity of consents do not apply to the services defined in the document at hand.

NOTE: Please note that theoretically, the access for extended account information could be granted also to not regulated parties not being licensed by PSD2 as AISP, as long as no payment accounts are part of the related consent.

API Services supported for the Extended Account Information Services

The current version of the Extended Account Information Services supports the following API services. Each Service Type represents access to account information to a particular category of accounts.

This document introduces the service types

- Extended Account Information Services to access information on single cards (XAIS-CRD),
- Extended Account Information Services to access information on savings accounts (XAIS-SAV),
- Extended Account Information Services to access information on loan accounts (XAIS-LOAN),
- Extended Account Information Services to access information on securities accounts (XAIS-SEC)

Specifics of the /cards vs. /card-accounts endpoints

The extended AIS for cards will define requests for an API Client to get information on one single card. However, in this context "single card" does not necessarily refer to only one physical card. Specifically, if a card is renewed and its successor does have the same PAN as the first card, both of them will be treated as one single card. There is (intentionally) no method to distinguish the two.

To specifically request information on one single card, a new "/cards" endpoint is defined. Access to the "/cards" endpoint works most regards analogously to access to a card-accounts endpoint with the exception, that the "/card" endpoint provides information on one single card instead of a card account, that might consist of more than one card. In addition, the /cards endpoint will deliver also information about monthly volumes of cards.

An important difference between the /card-accounts and the /cards endpoint is the underlying semantics of the balance type, see also Section 3.2.3. The balance for /card-accounts does not involve entries which are pending between card schemes and the ASPSP because it is the sole view of the card reconciliation account and has no view on the dedicated credit card processing system. The /cards endpoint takes all pending transactions into account



3 Application Layer: Guiding Principles

3.1 Signing Messages at Application Layer

The same conditions on signing messages by the API Client as defined in [oFA-ProtSec] apply to all API endpoints and methods defined by this specification, cp. Section 4.

3.2 API Access Methods

The table in section 3.2.5, "Overview of Endpoints", gives an overview on the HTTP access methods supported by the API endpoints for the Extended Account Information Services.

3.2.1 Conditions in the following Table

Whether the support of a method is mandated for the ASPSP by this specification or whether it is an optional feature for the ASPSP, is denoted in column "Condition". The general notion is, that conditions are given relative to the parent node of the path. In the context of Extended Account Information Services, this is always equivalent to a "global" condition" in the sense that the condition applies depending on whether the corresponding Extended Account Information Service is supported by the ASPSP at all.

Please note that all methods called by an API Client, which are addressing dynamically created resources in this API, may only apply to resources, which have been created by the same API Client before.

3.2.2 Examples

Please note also, that table in section 3.2.5 contains a column "Description" with a reference to a section where the endpoint is described in more detail. These sections provide examples for all related access methods.

3.2.3 Interpretation and Support of Balance Types

Many (currently: all) Extended Account Information Services support the transport of some kind of balance information for an account. What is understood as a "balance", strongly depends on the combination of the provided Balance Type (as defined in [oFA DaD]) and the service type as described above. The following table provides an Overview on which Balance Type codes are supported for which service type and how they are to be interpreted in the context of that service type:

Type	XAIS-CRD	XAIS-SAV	XAIS-LOAN	XAIS-SEC
closingBooked	Balance of the account at the end of the pre-agreed account reporting period. It is the sum of the opening booked balance at the beginning of the period and all entries booked to the account	As defined in [oFA DaD].	As defined in [oFA DaD].	Estimation based in the last fully finished trading date as interpreted by the ASPSP.

Type	XAIS-CRD	XAIS-SAV	XAIS-LOAN	XAIS-SEC
	during the pre-agreed account reporting period. For cards the account entries are booking entries from the card processor or invoices paid by the PSU.			
expected	Balance composed of booked entries and pending items known at the time of calculation, which projects the end of day balance if everything is booked on the account and no other entry is posted (as defined in [oFA DaD]).	As defined in [oFA DaD].	As defined in [oFA DaD].	Not supported.
openingBooked	Book balance of the account at the beginning of the account reporting period. It always equals the closing book balance from the previous report (as defined in [oFA DaD]).	As defined in [oFA DaD].	As defined in [oFA DaD].	Not supported.
interimAvailable	Available balance calculated in the course of the account 'servicer's business day, at the time specified, and subject to further changes during the business day. The interim balance is calculated on the basis of booked credit and debit items during the calculation time/period specified (as defined in [oFA DaD]). For cards, this is composed of • invoiced, but not yet paid entries • not yet invoiced but already booked entries	Not supported.	Not supported.	Intermediate estimation of the value. If a balance with type "interimAvailable" is used, it must indicate date and time of the evaluation in element referenceDateTime.

Type	XAIS-CRD	XAIS-SAV	XAIS-LOAN	XAIS-SEC
	pending items (not yet booked) Note: The “interimAvailable” balance where “creditLimitIncluded” equals true is the open to buy limit of the relevant card, while the “interimBooked” limit (next row) is referring to bookings between the card scheme and the bank, and the bank and the PSU respectively during the accounting period.			
interimBooked	Balance calculated in the course of the account servicer's business day, at the time specified, and subject to further changes during the business day. The interim balance is calculated on the basis of booked credit and debit items during the calculation time/period specified (as defined in [oFA DaD]). Remark: For cards, this time period consists of the accounting period of the related card, e.g. the interim booked items during a month.	As defined in [oFA DaD].	As defined in [oFA DaD].	Not supported.
forwardAvailable	Forward available balance of money that is at the disposal of the account owner on the date specified (as defined in [oFA DaD]).	Not supported.	Not supported.	Not supported.
nonInvoiced	Only for card accounts, to be defined yet(as defined in [oFA DaD]).	Not supported.	Not supported.	Not supported.

3.2.4 Examples for calculating the card balance types

In the following, the above definitions for card balances are explained with examples due to the card specifics and the mapping of ISO20022 status codes defined above, which are not used today in ASPSP systems for cards.

Balance type interimAvailable

The following table give two examples on how the "interimAvailable" is calculated in case of "creditLimitIncluded" (true or false) in a setting, where

- Card 1 is associated with a partner card (Card 2),
- both cards have an individual limit and
- there is an additional "aggregated limit" applicable for both of them.

Please note that "debitAccounting" flag in all these cases equals *false*.

Note: The "interimAvailable" balance where "creditLimitIncluded" equals true is the open to buy limit of the relevant card, while the "interimBooked" limit is referring to bookings between the card scheme and the bank, and the bank and the PSU respectively during the accounting period.

Aggregate d Credit Limit	Credit Limit Card 1	Credit Limit Card 2	Spending Card 1	Spending Card 2	Interim Available Card 1 (Credit Limit included)	Interim Booked Card 1 (Credit Limit not included)
700	500	500	100	500	100	-100
700	500	500	400	50	100	-400

Balance Types closingBooked and interimBooked for credit cards

The "closingBooked" balance is the balance of the card at the end of an accounting period, i.e. at the end of the related invoicing period for credit cards. In case of the "debitAccounting" flag equals *false*, the example would be e.g.:

- closingBooked Balance at 31st July (end of invoicing period): -3456,12 Euro
- interimBooked Balance at 1st August (invoicing period not yet paid, new card transaction of 20 Euro): -3476,12 Euro
- interimBooked Balance at 2nd August (invoice had been paid): -20 Euro.

Balance Types closingBooked and interimAvailable for prepaid cards

The "closingBooked" balance is the balance of the card at the end of an accounting period, i.e. at the end of the day for prepaid cards. In case of the "debitAccounting" flag equals *false*, the example would be e.g.:

- closingBooked Balance at 14 June 123,12 Euro

- interimAvailable Balance at 14 June, 1 pm. 103,12 Euro (20 Euro was used for shopping)
- closingBooked Balance at 15 June 103,12 Euro

3.2.5 Overview of Endpoints

Endpoints/Resources	Method	Condition	Description
Endpoints for XAIS-CRD			
/cards	GET	Conditional	Must be supported, if the ASPSP supports the XAIS-CRD at all. Read the identifiers of the all cards (usually credit cards), to which an access has been granted to through the /consents endpoint by the PSU. In addition, relevant information about the cards and hyperlinks to corresponding card information resources are provided if a related consent has been already granted. See section 4.2.1.
/cards/{card-id}	GET	Mandatory	Read detailed information about the addressed card. See section 4.2.2.
/cards/{card-id}/balances	GET	Mandatory	Read detailed balance information about the addressed card. See section 4.2.3.
/cards/{card-id}/transactions	GET	Mandatory	Read the transaction list of the addressed card. For a given card, additional parameters are e.g. the attributes "dateFrom" and "dateTo". See section 4.2.4.
Endpoints for XAIS-SAV			
/savings	GET	Conditional	Must be supported, if the ASPSP supports XAIS-SAV at all. Read the identifiers of all accounts of the XAIS-SAV, to which an account access has been granted to through

Endpoints/Resources	Method	Condition	Description
			consents that is referred to in the request. See section 4.3.1.
/savings/{account-id}	GET	Mandatory	Give detailed information about the addressed account. See section 4.3.2.
/savings/{account-id}/balances	GET	Mandatory	Give detailed balance information about the addressed account. See section 4.3.3.
/savings/{account-id}/transactions	GET	Mandatory	Read the transaction list of the addressed account. For a given account, additional parameters are e.g. the attributes "dateFrom" and "dateTo". See section 4.3.4.
Endpoints for XAIS-LOAN			
/loans	GET	Conditional	Must be supported, if the ASPSP supports XAIS-LOAN at all. Read the identifiers of all accounts of the XAIS-LOAN, to which an account access has been granted to through consents that is referred to in the request. See section 4.4.1.
/loans/{account-id}	GET	Mandatory	Give detailed information about the addressed account. See section 4.4.2.
/loans/{account-id}/balances	GET	Mandatory	Give detailed balance information about the addressed account. See section 4.4.3.
/loans/{account-id}/transactions	GET	Mandatory	Read the transaction list of the addressed account. For a given account, additional parameters are

Endpoints/Resources	Method	Condition	Description
			e.g. the attributes "dateFrom" and "dateTo". See section 4.4.4.
Endpoints for XAIS-SEC			
/securities-accounts	GET	Conditional	Must be supported, if the ASPSP supports XAIS-SEC at all. Read the identifiers of all accounts of the XAIS-SEC, to which an account access has been granted to through consents that is referred to in the request. See section 4.5.1.
/securities-accounts/{account-id}	GET	Mandatory	Give detailed information about the addressed account. See section 4.5.2.
/securities-accounts/{account-id}/positions	GET	Mandatory	Read an overview of the positions contained in the addressed securities account. See section 4.5.3.
/securities-accounts/{account-id}/transactions	GET	Mandatory	Read the transaction list of the addressed account. For a given account, additional parameters are e.g. the attributes "dateFrom" and "dateTo". See section 4.5.4.
/securities-accounts/{account-id}/transactions/{transaction-id}	GET	Optional	Read transaction details of an addressed transaction on the addressed securities account. See section 4.5.5.
/securities-accounts/{account-id}/orders	GET	Mandatory	Read the order lists of the addressed securities account. See section 4.5.6.



Endpoints/Resources	Method	Condition	Description
/securities-accounts/ {account-id}/orders/ {order-id}	GET	Optional	Read order details of the addressed order. See section 4.5.7.

NOTE: All access methods on the Extended AIS API need a technical consent established through the mechanisms as specified in [oFA-CO] for the endpoints v2/consents/account-access.



4 Extended Account Information

NOTE: The orange colour in this chapter is identifying paragraphs of the specification, where the Extended Account Information Service is deviating from the Core Account Information Services as defined in [oFA-ComV2].

4.1 Extended Read Account Data Flows

The Read Account Data Flow for all Extended Account Information Services is following exactly the flows of the Read Account Data Flow as defined in [oFA-ComV2].

Therefore, no specific API flows are described in the document at hand. The flows will be inherited the Read Account Data Flow in [oFA-ComV2].

4.2 Endpoints for Single Cards (XAIS-CRD)

4.2.1 Read Card List

4.2.1.1 Request

Call

GET /v2/cards

Reads a list of cards potentially with additional information, such as balance information. It is assumed that a consent of the PSU to this access is already given and stored on the ASPSP system. The addressed list of cards depends then on the PSU ID and the consent addressed by consentId, respectively the OAuth2 access token.

Note: In case of corresponding access rights granted by the consent, additional details might be retrieved by addressing the /cards/{card-id} endpoint, cp. section 4.2.2.

Query Parameters

No specific query parameter.

Request Header

Attribute	Type	Condition	Description
X-Request-ID	UUID	Mandatory	ID of the request, unique to the call, as determined by the initiating party. The X-Request-ID serves as an impotency key.
PSU-IP-Address	String	Conditional	The forwarded IP Address header field consists of the corresponding HTTP request IP Address field between PSU and TPP. It shall be contained if and only if this request was actively initiated by the PSU.

Attribute	Type	Condition	Description
Consent-ID	Max70Text	Mandatory	Identification of the corresponding consent as granted by the PSU.
Authorization	String	Conditional	Is contained only, if an OAuth2 based authentication was performed in a pre-step or an OAuth2 based SCA was performed in the related consent authorisation.
API-Contract-ID	UUID	Conditional	Might be mandated by ASPSP or business rules of related API access schemes. ID of the underlying API service contract between API Client and API Server, resulting from API Client onboarding, following [oFA-IG-ADM]. The API-Contract-ID may differ from the API-Contract-ID used during consent establishment of the consent referenced in header field Consent-ID, e.g. in case of a change of relevant commercial conditions after consent establishment.

Request Body

No request body.

4.2.1.2 Response

Response Code

HTTP Response Code equals 200.

Response Header

Attribute	Type	Condition	Description
X-Request-ID	UUID	Mandatory	ID of the request, unique to the call, as determined by the initiating party.

Response Body

Attribute	Type	Condition	Description
cards	Array of Card Account Details	Mandatory	Descriptions of the accessible cards.

Remark: The same syntactical structure is used to transport card information as card account information. In difference to the card-accounts context, in some attributes properties of the dedicated card are provided instead of properties of the underlying reconciliation account. This applies for example to the status attribute.

NOTE: If one of the card is a multicurrency card, then the account currency equals "XXX" as for current accounts.

4.2.1.3 Example

Request

GET https://api.testbank.com/v2/cards

```
Accept: application/json
X-Request-ID: 99391c7e-ad88-49ec-a2ad-99ddcb1f7756
Consent-ID: 8bd44685-026d-4484-8cc2-243d4f0b04ff
Date: Thu, 29 Oct 2020 15:05:37 GMT
API-Contract-ID: 3bd7ccec-6510-4907-909d-2fbc0fc5f0f0
```

Response

```
HTTP/1.x 200 Ok
X-Request-ID: 99391c7e-ad88-49ec-a2ad-99ddcb1f7756
Content-Type: application/json
Date: Thu, 29 Oct 2020 15:05:38 GMT
```

```
{
  "cards": [
    {
      "resourceId": "6d9a81b3-a47d-4130-8765-a9c0ff861b99",
      "maskedPan": "525412*****3241",
      "currency": "EUR",
      "name": "Main",
      "product": "Basic Credit Card",
      "debitAccounting": false,
      "status": "enabled",
      "creditLimit": {"currency": "EUR", "amount": "5000"},
      "balances": [
```

```

    {
      "balanceAmount": {"currency": "EUR", "amount": "-1390.10"},
      "balanceType": "interimBooked"
    }, {
      "balanceAmount": {"currency": "EUR", "amount": "3609.90"},
      "balanceType": "interimAvailable",
      "creditLimitIncluded": true
    }
  ]
}, {
  "resourceId": "6d9a81b3-a47d-4130-8765-a9c0ff861b98",
  "maskedPan": "525412*****3242",
  "currency": "EUR",
  "name": "PartnerCard",
  "product": "Basic Credit Card",
  "debitAccounting": false,
  "status": "enabled",
  "creditLimit": {"currency": "EUR", "amount": "5000"},
  "balances": [
    {
      "balanceAmount": {"currency": "EUR", "amount": "-559.10"},
      "balanceType": "interimBooked"
    }, {
      "balanceAmount": {"currency": "EUR", "amount": "4440.90"},
      "balanceType": "interimAvailable",
      "creditLimitIncluded": true
    }
  ]
}
]
}

```

4.2.2 Read Card Details

4.2.2.1 Request

Call

GET /v2/cards/{card-id}

Reads details about a card. It is assumed that a consent of the PSU to this access is already given and stored on the ASPSP system. The addressed details of this account depends then on the stored consent addressed by consentId, respectively the OAuth2 access token.

Path Parameters

Attribute	Type	Description
card-id	Max70Text	This identification is denoting the addressed card. The card-id is retrieved by using a "Read Card List" call. The card-id is the "resourceId" attribute of the card structure. Its value is constant at least throughout the lifecycle of a given consent.

Query Parameters

No specific query parameter.

Request Header

The same requirements towards request headers apply as for the "Read Card List" request (see section 4.2.1).

Request Body

No request body.

4.2.2.2 Response

Response Code

HTTP Response Code equals 200.

Response Header

Attribute	Type	Condition	Description
X-Request-ID	UUID	Mandatory	ID of the request, unique to the call, as determined by the initiating party.

Response Body

Attribute	Type	Condition	Description
card	Card Account Details	Mandatory	Description of the addressed card.

Remark: The same syntactical structure is used to transport card information as card account information.

NOTE: If the card is a multicurrency card, then the account currency equals “XXX” as for current accounts.

4.2.2.3 Examples

4.2.2.3.1 Standard Card

GET <https://api.testbank.com/v2/cards/6d9a81b3-a47d-4130-8765-a9c0ff861b99>

```
Accept:                application/json
X-Request-ID:          99391c7e-ad88-49ec-a2ad-99ddcb1f7750
Consent-ID:            8bd44685-026d-4484-8cc2-243d4f0b04ff
Date:                  Thu, 29 Oct 2020 15:05:37 GMT
API-Contract-ID:       3bd7ccec-6510-4907-909d-2fbc0fc5f0f0
```

Response

```
HTTP/1.x 200 Ok
X-Request-ID:          99391c7e-ad88-49ec-a2ad-99ddcb1f7750
Content-Type:          application/json
Date:                  Thu, 29 Oct 2020 15:05:38 GMT
```

```
{
  "card": {
    "resourceId": "6d9a81b3-a47d-4130-8765-a9c0ff861b99",
    "maskedPan": "525412*****3241",
    "currency": "EUR",
    "debitAccounting": false,
    "name": "Main",
    "product": "Basic Credit Card",
    "status": "enabled",
    "creditLimit": {"currency": "EUR", "amount": "5000"},
    "balances": [
      {
        "balanceAmount": {"currency": "EUR", "amount": "-1390.10"},
        "balanceType": "interimBooked"
      }, {
        "balanceAmount": {"currency": "EUR", "amount": "3609.90"},
        "balanceType": "interimAvailable",
        "creditLimitIncluded": true
      }
    ],
    "_links": {
      "self": {
        "href": "/v2/cards/4d9a81b3-a47d-4130-8765-a9c0ff861b99"
      }
    }
  },
}
```

```

    "transactions": {
      "href": "/v2/cards/4d9a81b3-a47d-4130-8765-a9c0ff861b99/transactions"
    }
  }
}

```

4.2.2.3.2 Multicurrency Card with Balances)

GET https://api.testbank.com/v2/cards/6d9a81b3-a47d-4130-8765-a9c0ff861b00

Accept: application/json
 X-Request-ID: 99391c7e-ad88-49ec-a2ad-99ddcb1f77aa
 Consent-ID: 8bd44685-026d-4484-8cc2-243d4f0b04ff
 Date: Thu, 29 Oct 2020 15:05:37 GMT
 API-Contract-ID: 3bd7ccec-6510-4907-909d-2fbc0fc5f0f0

Response

HTTP/1.x 200 Ok

X-Request-ID: 99391c7e-ad88-49ec-a2ad-99ddcb1f77aa
 Content-Type: application/json
 Date: Thu, 29 Oct 2020 15:05:38 GMT

```

{
  "card": {
    "resourceId": "6d9a81b3-a47d-4130-8765-a9c0ff861b00",
    "maskedPan": "525412*****3241",
    "currency": "XXX",
    "name": "Main",
    "product": "Basic Credit Card",
    "debitAccounting": false,
    "status": "enabled",
    "creditLimit": {"currency": "EUR", "amount": "5000"},
    "balances": [
      {
        "balanceAmount": {"currency": "EUR", "amount": "-1390.10"},
        "balanceType": "interimBooked",
      }, {
        "balanceAmount": {"currency": "EUR", "amount": "3155.17"},
        "balanceType": "interimAvailable",
        "creditLimitIncluded": true
      }, {
        "balanceAmount": {"currency": "USD", "amount": "-500.20"},
        "balanceType": "interimBooked"
      }, {
        "balanceAmount": {"currency": "USD", "amount": "3470.69"},

```

```

        "balanceType": "interimAvailable",
        "creditLimitIncluded": true
    },
    ],
    "_links": {
        "self": {
            "href": "/v2/cards/6d9a81b3-a47d-4130-8765-a9c0ff861b00"
        },
        "transactions": {
            "href": "/v2/cards/6d9a81b3-a47d-4130-8765-a9c0ff861b00/transactions"
        }
    }
}

```

4.2.3 Read Card Balances

4.2.3.1 Request

Call

GET /v2/cards/{card-id}/balances

Reads balance data from a given card addressed by "card-id". Please note, that the current credit line of a given card might be tighter than what a response to this request will suggest due to general credit limits on the card account and transactions by other cards to the same card account.

Path Parameters

Attribute	Type	Description
card-id	Max70Text	This identification is denoting the addressed card. The card-id is retrieved by using a "Read Card List" call. The card-id is the "resourceId" attribute of the card structure. Its value is constant at least throughout the lifecycle of a given consent.

Query Parameters

Attribute	Type	Condition	Description
dateFrom	ISODate	optional	Requests in addition to the balances of the current accounting period all booked balances at the end of previous accounting periods (e.g. monthly periods) from the provided date on if still retrievable under the given consent.

Attribute	Type	Condition	Description
			Note: The accounting period is the invoicing period of the related card. This parameter is ignored by the ASPSP if it is not supported. A TPP may not include both parameters "dateFrom" and "valueDateFrom" in the same request.
valueDateFrom	ISODate	Optional	Requests in addition to the balances of the current accounting period all balances at the end of previous accounting periods (e.g. monthly periods) with payment due date starting from the provided date on if still retrievable under the given consent. A TPP may not include both parameters "dateFrom" and "valueDateFrom" in the same request. Note: The accounting period is the invoicing period of the related card. This parameter is ignored by the ASPSP if it is not supported.

Request Header

The same requirements towards request header apply as for the "Read Card List" request (see section 4.2.1).

Request Body

No request body.

4.2.3.2 Response

Response Code

HTTP Response Code equals 200.

Response Header

Attribute	Type	Condition	Description
X-Request-ID	UUID	Mandatory	ID of the request, unique to the call, as determined by the initiating party.

Response Body

Attribute	Type	Condition	Description
card	Account Reference	Mandatory	Identifier of the addressed card.
debitAccounting	Boolean	Optional	If true, the amounts of debits on the reports are quoted positive with the related consequence for balances. If false, the amounts of debits on the reports are quoted negative.
balances	Array of Balance	Mandatory	

4.2.3.3 Examples**4.2.3.3.1 Request for current Balances only (without PSU involvement)****Request**

GET https://api.testbank.com/v2/cards/6d9a81b3-a47d-4130-8765-a9c0ff861b99/balances

Accept: application/json
 X-Request-ID: 99391c7e-a188-49ec-a2ad-99ddcb1f7756
 Date: Sun, 20 Sep 2020 15:05:37 GMT
 API-Contract-ID: 3bd7cccec-6510-4907-909d-2fbc0fc5f0f0

Response

HTTP/1.x 200 Ok
 X-Request-ID: 99391c7e-a188-49ec-a2ad-99ddcb1f7756
 Content-Type: application/json
 Date: Sun, 20 Sep 2020 15:05:38 GMT

{

```

"card": {"maskedPan": "525412*****3241"},
"debitAccounting": false,
"balances": [
  {
    "balanceAmount": {"currency": "EUR", "amount": "5654.22"},
    "balanceType": "interimAvailable",
    "creditLimitIncluded": true
  }, {
    "balanceAmount": {"currency": "EUR", "amount": "-4355.78"},
    "balanceType": "interimBooked"
  }
]
}

```

4.2.3.3.2 Request covering also booked Balances of the Past (without PSU involvement)

Request

GET <https://api.testbank.com/v2/cards/6d9a81b3-a47d-4130-8765-a9c0ff861b99?dateFrom=2020-06-01>

Accept: application/json
 X-Request-ID: 99391c7e-a288-49ec-a2ad-99ddcb1f7757
 Date: Sun, 20 Sep 2020 15:05:39 GMT
 API-Contract-ID: 3bd7ccec-6510-4907-909d-2fbc0fc5f0f0

Response

HTTP/1.x 200 Ok
 X-Request-ID: 99391c7e-a288-49ec-a2ad-99ddcb1f7757
 Content-Type: application/json
 Date: Sun, 20 Sep 2020 15:05:40 GMT

```

{
  "card": {"maskedPan": "525412*****3241"},
  "debitAccounting": false,
  "balances": [
    {
      "balanceAmount": {"currency": "EUR", "amount": "5654.22"},
      "balanceType": "interimAvailable",
      "creditLimitIncluded": true
    }, {
      "balanceAmount": {"currency": "EUR", "amount": "-4355.78"},
      "balanceType": "interimBooked"
    }, {
      "balanceAmount": {"currency": "EUR", "amount": "-2255.45"},
      "balanceType": "closingBooked",

```

```
    "referenceDate": "2020-06-30"
  }, {
    "balanceAmount": {"currency": "EUR", "amount": "-1234.56"},
    "balanceType": "closingBooked",
    "referenceDate": "2020-07-31"
  }, {
    "balanceAmount": {"currency": "EUR", "amount": "-234.01"},
    "balanceType": "closingBooked",
    "referenceDate": "2020-08-31"
  }
]
}
```

4.2.4 Read Card Transaction List

4.2.4.1 Request

Call

GET /v2/cards/{card-id}/transactions

Reads transaction data from a given card addressed by "card-id".

Remark: This card-id is a tokenised identification due to data protection reason since the path information might be logged on intermediary servers within the ASPSP sphere. This card-id then can be retrieved by the "Read Card List" call, see section 4.2.1.

Note: The ASPSP might use standard compression methods on application level for the response message as indicated in the content encoding header.

Remark: Please note that the PATH might be already given in detail by the response of the "Read Card List" call within the `_links` subfield.

Path Parameters

Attribute	Type	Description
card-id	Max70Text	This identification is denoting the addressed card. The card-id is retrieved by using a "Read Card List" call. The card-id is the "resourceId" attribute of the card structure. Its value is constant at least throughout the lifecycle of a given consent.

Query Parameters

Attribute	Type	Condition	Description
dateFrom	ISODate	Conditional	Starting date (inclusive the date dateFrom) of the transaction list, mandated if no delta access is required.
dateTo	ISODate	Optional	End date (inclusive the data dateTo) of the transaction list, default is "now" if not given.
bookingStatus	String	Mandatory	Permitted codes are "booked", "pending" and "both". "booked" shall be supported by the ASPSP. To support the "pending" and "both" feature is optional for the ASPSP, Error code if not supported.
deltaList	Boolean	Optional if supported by API provider	This data attribute is indicating that the API Client is in favour to get all transactions after the last report access for this PSU on the addressed account. This delta indicator might be rejected by the ASPSP if this function is not supported.

Request Header

The same requirements towards request header apply as for the "Read Card List" request (see section 4.2.1).

Request Body

No request body.

4.2.4.2 Response

Response Code

HTTP Response Code equals 200.

Response Header

Attribute	Type	Condition	Description
X-Request-ID	UUID	Mandatory	ID of the request, unique to the call, as determined by the initiating party.

Response Body

Attribute	Type	Condition	Description
card	Account Reference	Mandatory	Identifier of the addressed card.
debitAccounting	Boolean	Optional	If true, the amounts of debits on the reports are quoted positive with the related consequence for balances. If false, the amounts of debits on the reports are quoted negative.
cardTransactions	Card Account Report	Optional	JSON based account report including only transactions for the specifically requested card.
balances	Array of Balance	Optional	A list of balances regarding this card, which might be restricted to the current balance.
_links	Links	Optional	A list of hyperlinks to be recognised by the TPP. Type of links admitted in this response: "download": a link to a resource, where the transaction report might be downloaded from in case where transaction reports have a huge size.

4.2.4.3 Example

Request

```
GET https://api.testbank.com/v2/cards/6d9a81b3-a47d-4130-8765-a9c0ff861b99/transactions?dateFrom=2017-10-01&dateTo=2017-10-30&bookingStatus=both
```

```
Accept: application/json
X-Request-ID: 99391c7e-a188-49ec-12ad-99ddcb1f7756
Date: Sun, 20 Sep 2020 15:05:37 GMT
API-Contract-ID: 3bd7ccec-6510-4907-909d-2fbc0fc5f0f0
```

Response

```
HTTP/1.x 200 Ok
X-Request-ID: 99391c7e-ad88-49ec-12ad-99ddcb1f7721
```

Date: Sun, 06 Aug 2017 15:05:47 GMT
Content-Type: application/json

```
{
  "card": {"maskedPan": "525412*****3241"},
  "debitAccounting": false,
  "cardTransactions": {
    "booked": [
      {
        "cardTransactionId": "201710020036959",
        "transactionAmount": {"currency": "EUR", "amount": "-256.67"},
        "grandTotalAmount": {"currency": "EUR", "amount": "-2566.70"},
        "transactionDate": "2017-10-25",
        "bookingDate": "2017-10-26",
        "valueDate": "2017-11-01",
        "cardAcceptorAddress": {
          "city" : "STOCKHOLM",
          "country" : "SE"
        },
        "proprietaryBankTransactionCode" : "INSTALMENT",
        "invoiced": false,
        "transactionDetails": "WIFIMARKET.SE"
      }, {
        "cardTransactionId": "201710020091863",
        "transactionAmount": {"currency": "EUR", "amount": "-10.72"},
        "transactionDate": "2017-10-25",
        "bookingDate": "2017-10-26",
        "valueDate": "2017-11-01",
        "originalAmount": {"currency": "SEK", "amount": "-99"},
        "cardAcceptorAddress": {
          "city" : "STOCKHOLM",
          "country" : "SE"
        },
        "proprietaryBankTransactionCode" : "PURCHASE",
        "invoiced": false,
        "transactionDetails": "ICA SUPERMARKET SKOGHA"
      }
    ],
    "pending": [],
    "_links": {
      "card": {
        "href": "/v2/cards/6d9a81b3-a47d-4130-8765-a9c0ff861b99"
      }
    }
  }
}
```



4.3 Endpoints for Savings Accounts (XAIS-SAV)

4.3.1 Read Account List

4.3.1.1 Request

Call

GET /v2/savings

Reads a list of savings accounts. The ASPSP may choose to provide information on balances in the response. It is assumed that a consent of the PSU to this access is already given and stored on the ASPSP system. The addressed list of accounts depends then on the PSU ID and the consent addressed by consentId, respectively the OAuth2 access token.

Note: If the consent is granted only to show the list of addressable accounts, much less details are displayed about the accounts. Specifically hyperlinks to additional resources such as balances or transaction endpoint should not be delivered then.

Note: In case of corresponding access rights granted by the consent, additional details might be retrieved by addressing the /savings/{account-id} endpoint, cp. Section 4.3.2.

Path Parameters

No path parameters defined.

Query Parameters

No query parameters defined.

Request Header

Attribute	Type	Condition	Description
X-Request-ID	UUID	Mandatory	ID of the request, unique to the call, as determined by the initiating party. The X-Request-ID serves as an impotency key.
Consent-ID	Max70Text	Mandatory	Consent-Id as obtained during consent establishment for the consent resulting from the "Establish Consent on Account Information" performed via this API before.
PSU-IP-Address	String	Conditional	The forwarded IP Address header field consists of the corresponding HTTP request IP Address field between PSU and TPP. It shall be contained if and only if this request was actively initiated by the PSU.
Authorization	String	Conditional	Is contained only, if an OAuth2 based authentication was performed in a pre-step or an

Attribute	Type	Condition	Description
			OAuth2 based SCA was performed in the related consent authorisation.
API-Contract-ID	UUID	Conditional	Might be mandated by ASPSP or business rules of related API access schemes. ID of the underlying API service contract between API Client and API Server, resulting from API Client onboarding, following [oFA-IG-ADM]. The API-Contract-ID may differ from the API-Contract-ID used during consent establishment of the consent referenced in header field Consent-ID, e.g. in case of a change of relevant commercial conditions after consent establishment.

Request Body

No request body.

4.3.1.2 Response

Response Code

The HTTP response code equals 200.

Response Header

Attribute	Type	Condition	Description
X-Request-ID	UUID	Mandatory	ID of the request, unique to the call, as determined by the initiating party.

Response Body

Attribute	Type	Condition	Description
accounts	Array of Account Details	Mandatory	In case, no account is accessible, the ASPSP shall return an empty array. As this is also considered a positive response, the Response code must still be 200. Please note that some attributes of an Account Details object are only supported for

Attribute	Type	Condition	Description
			specific account types. For Details, see [oFA DaD].

4.3.1.3 Example

Request

GET https://api.testbank.com/v2/savings

Accept: application/json
 X-Request-ID: 99391c7e-ad88-49ec-a2ad-99ddcb1f7756
 Consent-ID: 8bd44685-026d-4484-8cc2-243d4f0b04ff
 Date: Thu, 29 Oct 2020 15:05:37 GMT
 API-Contract-ID: 3bd7ccec-6510-4907-909d-2fbc0fc5f0f0

Response

HTTP/1.x 200 Ok
 X-Request-ID: 99391c7e-ad88-49ec-a2ad-99ddcb1f7756
 Content-Type: application/json
 Date: Thu, 29 Oct 2020 15:05:38 GMT

```
{
  "accounts": [
    {
      "resourceId": "4dc3d5b3-7023-4848-9853-f5400a64e81g",
      "other": {"identification": "MyProprietaryID-0001"},
      "currency": "EUR",
      "ownerName": "Paul Simpson",
      "name": "Savings 1a",
      "product": "Saving Account",
      "cashAccountType": "SVGS",
      "interest": [
        {
          "type": "FIXD",
          "rate": [
            {
              "percentage": "1.5",
              "fromAmount": {"currency": "EUR", "amount": "0.0"},
              "toAmount": {"currency": "EUR", "amount": "2000"}
            }, {
              "percentage": "0.1",
              "fromAmount": {"currency": "EUR", "amount": "2000"}
            }
          ]
        }
      ],
    }
  ],
}
```

```

        "toDateTime": "2017-01-05T23:59:59"
      }, {
        "type": "FIXD",
        "rate": [
          {
            "percentage": "0.5",
            "fromAmount": {"currency": "EUR", "amount": "0.0"},
            "toAmount": {"currency": "EUR", "amount": "2000"}
          }, {
            "percentage": "0.1",
            "fromAmount": {"currency": "EUR", "amount": "2000"}
          }
        ],
        "fromDateTime": "2017-01-06T00:00:00"
      }
    ],
    "relatedDates": {
      "contractStartDate": "2016-01-01",
      "contractEndDate": "2026-01-01",
      "contractAvailabilityDate": "2019-01-01"
    },
    "balances": [
      {
        "balanceAmount": {"currency": "EUR", "amount": 5000.00},
        "balanceType": "closingBooked",
        "referenceDate": "2020-10-01"
      }
    ],
    "_links": {
      "balances": {
        "href": "/v2/savings/4dc3d5b3-7023-4848-9853-f5400a64e81g/balances"
      },
      "transactions": {
        "href": "/v2/savings/4dc3d5b3-7023-4848-9853-f5400a64e81g/transactions"
      }
    }
  }, {
    "resourceId": "4dc3d5b3-7023-4848-9853-f5400a64e813",
    "other": {"identification": "MyProprietaryID-0002"},
    "currency": "EUR",
    "ownerName": "Paul Simpson",
    "name": "Savings 1b",
    "product": "Saving Account",
    "cashAccountType": "SVGS",
    "interest": [
      {
        "type": "FIXD",

```

```

    "rate": [
      {
        "percentage": "1.5",
        "fromAmount": {"currency": "EUR", "amount": "0.0"},
        "toAmount": {"currency": "EUR", "amount": "2000"}
      }, {
        "percentage": "0.1",
        "fromAmount": {"currency": "EUR", "amount": "2000"}
      }
    ],
    "toDateTime": "2017-01-05T23:59:59"
  }, {
    "type": "FIXD" ,
    "rate": [
      {
        "percentage": "0.5",
        "fromAmount": {"currency": "EUR", "amount": "0.0"},
        "toAmount": {"currency": "EUR", "amount": "2000"}
      }, {
        "percentage": "0.1",
        "fromAmount": {"currency": "EUR", "amount": "2000"}
      }
    ],
    "fromDateTime": "2017-01-06T00:00:00"
  }
],
"relatedDates": {
  "contractSstartDate": "2016-01-01",
  "contractEndDate": "2026-01-01",
  "contractAvailabilityDate" : "2019-01-01"
},
"balances": [
  {
    "balanceAmount": {"currency": "EUR", "amount": 4000.00},
    "balanceType": "closingBooked",
    "referenceDate": "2020-10-01"
  }
],
"_links": {
  "balances": {
    "href": "/v2/savings/4dc3d5b3-7023-4848-9853-f5400a64e813/balances"
  },
  "transactions": {
    "href": "/v2/savings/4dc3d5b3-7023-4848-9853-f5400a64e813/transactions"
  }
}
}, {

```

```

"resourceId": "4dc3d5b4-5765-4848-9853-f5400a64e81g",
"iban": "DE2310010010123456799",
"currency": "XXX",
"ownerName": "Paul Simpson",
"name": "Savings 2",
"product": "Saving Account",
"cashAccountType": "SVGS",
"interest": [
  {
    "type": "FIXD",
    "rate": [
      {
        "percentage": "1.5",
        "fromAmount": {"currency": "EUR", "amount": "0.0"},
        "toAmount": {"currency": "EUR", "amount": "2000"}
      }, {
        "percentage": "0.1",
        "fromAmount": {"currency": "EUR", "amount": "2000"}
      }
    ],
    "toDateTime": "2017-01-05T23:59:59"
  }, {
    "type": "FIXD",
    "rate": [
      {
        "percentage": "0.5",
        "fromAmount": {"currency": "EUR", "amount": "0.0"},
        "toAmount": {"currency": "EUR", "amount": "2000"}
      }, {
        "percentage": "0.1",
        "fromAmount": {"currency": "EUR", "amount": "2000"}
      }
    ],
    "fromDateTime": "2017-01-06T00:00:00"
  }, {
    "type": "FIXD",
    "rate": [
      {
        "percentage": "1.5",
        "fromAmount": {"currency": "ILS", "amount": "0.0"},
        "toAmount": {"currency": "ILS", "amount": "8000"}
      }, {
        "percentage": "0.1",
        "fromAmount": {"currency": "ILS", "amount": "8000"}
      }
    ],
    "toDateTime": "2017-01-05T23:59:59"
  }, {
    "type": "FIXD",

```

```
    "rate": [
      {
        "percentage": "0.5",
        "fromAmount": {"currency": "ILS", "amount": "0.0"},
        "toAmount": {"currency": "ILS", "amount": "8000"}
      }, {
        "percentage": "0.1",
        "fromAmount": {"currency": "ILS", "amount": "8000"}
      }
    ],
    "fromDateTime": "2017-01-06T00:00:00"
  }
],
"relatedDates": {
  "contractStartDate": "2016-01-01",
  "contractEndDate": "2026-01-01",
  "contractAvailabilityDate": "2019-01-01"
},
"balances": [
  {
    "balanceAmount": {"currency": "EUR", "amount": 10000.00},
    "balanceType": "closingBooked",
    "referenceDate": "2020-10-01"
  }, {
    "balanceAmount": {"currency": "ILS", "amount": 40000.00},
    "balanceType": "closingBooked",
    "referenceDate": "2020-10-01"
  }
],
"_links": {
  "balances": {
    "href": "/v2/savings/4dc3d5b4-5765-4848-9853-f5400a64e81g/balances"
  },
  "transactions": {
    "href": "/v2/savings/4dc3d5b4-5765-4848-9853-f5400a64e81g/transactions"
  }
}
}
```

4.3.2 Read Account Details

4.3.2.1 Request

Call

GET /v2/savings/{account-id}

Reads details about a savings account. The ASPSP may choose to provide information on balances in the response. It is assumed that a consent of the PSU to this access is already given and stored on the ASPSP system. The addressed list of accounts depends then on the PSU ID and the consent addressed by consentId, respectively the OAuth2 access token.

Path Parameters

Attribute	Type	Description
account-id	Max70Text	This identification is denoting the addressed account. The account-id is retrieved by a (successful) "Read Account List" request as described in section 4.3.1. The account-id is the "resourceId" attribute of the account structure. Its value is constant at least throughout the lifecycle of a given consent.

Query Parameters

No query parameters defined.

Request Header

The same requirements towards request headers apply as for the "Read Account List" request (see section 4.3.1).

Request Body

No request body.

4.3.2.2 Response

Response Code

HTTP Response Code equals 200.

Response Header

Attribute	Type	Condition	Description
X-Request-ID	UUID	Mandatory	ID of the request, unique to the call, as determined by the initiating party.

Response Body

Attribute	Type	Condition	Description
account	Account Details	Mandatory	Description of the addressed account.

4.3.2.3 Example**Request**

GET https://api.testbank.com//v2/savings/4dc3d5b3-7023-4848-9853-f5400a64e81g

Accept: application/json
 X-Request-ID: 99391c7e-ad88-49ec-a2ad-99ddcb1f7756
 Consent-ID: 8bd44685-026d-4484-8cc2-243d4f0b04ff
 Date: Thu, 29 Oct 2020 15:05:37 GMT
 API-Contract-ID: 3bd7ccce-6510-4907-909d-2fbc0fc5f0f0

Response

HTTP/1.x 200 Ok
 X-Request-ID: 99391c7e-ad88-49ec-a2ad-99ddcb1f7756
 Content-Type: application/json
 Date: Thu, 29 Oct 2020 15:05:38 GMT

```
{
  "account": {
    "resourceId": "4dc3d5b3-7023-4848-9853-f5400a64e81g",
    "iban": "DE2310010010123456788",
    "currency": "EUR",
    "ownerName": "Paul Simpson",
    "name": "Savings 1",
    "product": "Saving Account",
    "cashAccountType": "SVGS",
    "status": "enabled",
    "interest": [
      {
        "type": "FIXD",
        "rate": [
          {
            "percentage": "1.5",
            "fromAmount": {"currency": "EUR", "amount": "0.0"},
            "toAmount": {"currency": "EUR", "amount": "2000"}
          }, {
            "percentage": "0.1",
```

```

        "fromAmount": {"currency": "EUR", "amount": "2000"}
      }
    ],
    "toDateTime": "2017-01-05T23:59:59"
  }, {
    "type": "FIXD" ,
    "rate": [
      {
        "percentage": "0.5",
        "fromAmount": {"currency": "EUR", "amount": "0.0"},
        "toAmount": {"currency": "EUR", "amount": "2000"}
      }, {
        "percentage": "0.1",
        "fromAmount": {"currency": "EUR", "amount": "2000"}
      }
    ],
    "fromDateTime": "2017-01-06T00:00:00"
  }
],
"relatedDates": {
  "contractStartDate": "2016-01-01",
  "contractEndDate": "2026-01-01",
  "contractAvailabilityDate" : "2019-01-01"
},
"balances": [
  {
    "balanceAmount": {"currency": "EUR", "amount": 5000.00},
    "balanceType": "closingBooked",
    "referenceDate": "2020-10-01"
  }
],
"_links": {
  "balances": {
    "href": "/v2/savings/4dc3d5b3-7023-4848-9853-f5400a64e81g/balances"
  },
  "transactions": {
    "href": "/v2/savings/4dc3d5b3-7023-4848-9853-f5400a64e81g/transactions"
  }
}
}
}

```

4.3.3 Read Account Balances

4.3.3.1 Request

Call

GET /v2/savings/{account-id}/balances

Reads balance data from a given savings account addressed by "account-id".

Path Parameters

Attribute	Type	Description
account-id	Max70Text	This identification is denoting the addressed account. The account-id is retrieved by a (successful) "Read Account List" request as described in section 4.3.1. The account-id is the "resourceId" attribute of the account structure. Its value is constant at least throughout the lifecycle of a given consent.

Query Parameters

No query parameters defined.

Request Header

The same requirements towards request headers apply as for the "Read Account List" request (see section 4.3.1).

Request Body

No request body.

4.3.3.2 Response

Response Code

HTTP Response Code equals 200.

Response Header

Attribute	Type	Condition	Description
X-Request-ID	UUID	Mandatory	ID of the request, unique to the call, as determined by the initiating party.

Response Body

Attribute	Type	Condition	Description
account	Account Reference	Mandatory	Identifier of the addressed account.
balances	Array of Balance	Mandatory	For the usage and interpretation of the balance type, compare section 3.2.3.

4.3.3.3 Example

Request

GET https://api.testbank.com/v2/savings/4dc3d5b3-7023-4848-9853-f5400a64e81g/balances

Accept: application/json
 X-Request-ID: 99391c7e-ad88-49ec-a2ad-89ddcb1f7756
 Consent-ID: 8bd44685-026d-4484-8cc2-243d4f0b04ff
 Date: Thu, 29 Oct 2020 15:05:37 GMT
 API-Contract-ID: 3bd7ccec-6510-4907-909d-2fbc0fc5f0f0

Response

HTTP/1.x 200 Ok
 X-Request-ID: 99391c7e-ad88-49ec-a2ad-89ddcb1f7756
 Content-Type: application/json
 Date: Thu, 29 Oct 2020 15:05:38 GMT

```
{
  "account": {"iban": "DE2310010010123456788"},
  "balances": [
    {
      "balanceAmount": {"currency": "EUR", "amount": "5000.00"},
      "balanceType": "closingBooked",
      "referenceDate": "2020-10-20"
    }
  ]
}
```

4.3.4 Read Transaction List

4.3.4.1 Request

Call

GET /v2/savings/{account-id}/transactions

Reads transaction data from a given savings account addressed by "account-id".

Note: The ASPSP might use standard compression methods on application level for the response message as indicated in the content encoding header.

Remark: Please note that the PATH might be already given in detail by the response of the "Read Account List" call within the `_links` subfield.

Path Parameters

Attribute	Type	Description
account-id	Max70Text	This identification is denoting the addressed account. The account-id is retrieved by a (successful) "Read Account List" request as described in section 4.3.1. The account-id is the "resourceId" attribute of the account structure. Its value is constant at least throughout the lifecycle of a given consent.

Query Parameters

Attribute	Type	Condition	Description
dateFrom	ISODate	Conditional	Starting date (inclusive the date dateFrom) of the transaction list, mandated if no delta access is required and if bookingStatus does not equal "information". In the case of booked transactions, the relevant date is the booking date. In the case of pending transactions, the relevant date is the entry date, which may not be transparent neither in this API nor other channels of the ASPSP.
dateTo	ISODate	Optional	End date (inclusive the date dateTo) of the transaction list, default is "now" if not given. Might be ignored if a delta function is used. "dateTo" is always applied to the same date as "dateFrom" (see previous row).

Attribute	Type	Condition	Description
entryReferenceFrom	String	Optional if supported by API provider	This data attribute is indicating that the API Client is in favour to get all transactions after the transaction with identification entryReferenceFrom alternatively to the above defined period. This is an implementation of a delta access. If this data element is contained, the entries "dateFrom" and "dateTo" might be ignored by the ASPSP if a delta report is supported.
bookingStatus	String	Mandatory	Usage of an unsupported value for bookingStatus (context sensitive, see descriptions below) shall result in a response with the corresponding error code (PARAMETER_NOT_SUPPORTED). Permitted codes are "booked", "pending" and "both". "booked" shall be supported by the ASPSP To support the "pending" and "both" feature is optional for the ASPSP, Error code if not supported. If supported, "both" means to request transaction reports of transaction of bookingStatus either "pending" or "booked".
deltaList	Boolean	Optional if supported by API provider	This data attribute is indicating that the API Client is in favour to get all transactions after the last report access for this PSU on the addressed account. This is another implementation of a delta access-report. This delta indicator might be rejected by the ASPSP if this function is not supported. If this data element is contained, the entries "dateFrom" and "dateTo" might be ignored by the ASPSP if a delta report is supported.

Request Header

With the exception of the "Accept" header, the same requirements towards request headers apply as for the "Read Account List" request (see section 4.3.1):

Attribute	Type	Condition	Description
X-Request-ID	UUID	Mandatory	ID of the request, unique to the call, as determined by the initiating party.
PSU-IP-Address	String	Conditional	The forwarded IP Address header field consists of the corresponding HTTP request IP Address field between PSU and TPP. It shall be contained if and only if this request was actively initiated by the PSU.
Consent-ID	Max70Text	Mandatory	
Authorization	String	Conditional	Is contained only, if an OAuth2 based authentication was performed in a pre-step or an OAuth2 based SCA was performed in the related consent authorisation.
Accept	String	Optional	The TPP can indicate the formats of account reports supported together with a prioritisation following the HTTP header definition. The formats supported by this specification are • xml • JSON • text
API-Contract-ID	UUID	Conditional	Might be mandated by ASPSP or business rules of related API access schemes. ID of the underlying API service contract between API Client and API Server, resulting from API Client onboarding, following [oFA-IG-ADM]. The API-Contract-ID may differ from the API-Contract-ID used during consent establishment of the consent referenced in header field Consent-ID, e.g. in case of a change of relevant commercial conditions after consent establishment.

Remark: The Berlin Group intends to apply for vnd-entries within the "accept" attribute for camt.05x and MT94x formats to scope with different account report formats available for the PSU e.g. in a corporate context. These values will be added to this specification as soon as available. This will then lead to expressions like /application/vnd.BerlinGroup.camt.053+xml etc. The TPP then could e.g. say: "I prefer camt.054, but take camt.053 if this is not available." This solution is recommended as a best practice until it is fully specified. In this example this would deliver the following accept header expression:

Accept: `/application/vnd.BerlinGroup.camt.054+xml;q=0.9,`
`/application/vnd.BerlinGroup.camt.053+xml;q=0.8`

In addition, these best practices allow to differentiate technical sub versions of camt, i.e. it could be stated that "I prefer camt.054.001.08 (the new sub version), but take (the older sub version) camt.054.001.02 if this is not available." This is to supports ASPSPs in migrating the technical camt formats.

Accept: `/application/vnd.BerlinGroup.camt.054.001.08+xml;q=0.9,`
`application/vnd.BerlinGroup.camt.054.001.02+xml;q=0.8`

Request Body

No request body.

4.3.4.2 Response

Response Code

HTTP Response Code equals 200.

Response Header

Attribute	Type	Condition	Description
X-Request-ID	UUID	Mandatory	ID of the request, unique to the call, as determined by the initiating party.

Response Body

If the ASPSP returns a **camt.05x** XML structure, the response body consists of either a camt.052 or camt.053 format. The camt.052 may include pending payments which are not yet finally booked. The ASPSP will decide on the format due to the chosen parameters, specifically on the chosen dates relative to the time of the request. In addition the ASPSP might offer camt.054x structure e.g. in a corporate setting.

If the ASPSP returns a **MT94x** content, the response body consists of an MT940 or MT942 format in a text structure. The MT942 may include pending payments which are not yet finally booked. The ASPSP will decide on the format due to the chosen parameters, specifically on the chosen dates relative to the time of the request.

A JSON response is defined as follows:

Attribute	Type	Condition	Description
account	Account Reference	Mandatory	Identifier of the addressed account.

Attribute	Type	Condition	Description
transactions	Account Report	Optional	JSON based account report. This account report contains transactions resulting from the query parameters.
balances	Array of Balance	Optional	A list of balances regarding this account, which might be restricted to the current balance.
_links	Links	Optional	A list of hyperlinks to be recognised by the TPP. Type of links admitted in this response: "download": a link to a resource, where the transaction report might be downloaded from in case where transaction reports have a huge size. Remark: This feature shall only be used where camt-data is requested which has a huge size.

4.3.4.3 Examples

Request

GET https://api.testbank.com/v2/savings/4dc3d5b3-7023-4848-9853-f5400a64e81g/transactions?dateFrom=2020-08-30&dateTo=2020-10-31&bookingStatus=both

Accept: application/json
X-Request-ID: 99391c72-ad88-49ec-a2ad-89ddcb1f7756
Consent-ID: 8bd44685-026d-4484-8cc2-243d4f0b04ff
Date: Thu, 29 Oct 2020 15:05:37 GMT
API-Contract-ID: 3bd7ccec-6510-4907-909d-2fbc0fc5f0f0

Response

HTTP/1.x 200 Ok
X-Request-ID: 99391c72-ad88-49ec-a2ad-99ddcb1f7756
Content-Type: application/json
Date: Thu, 29 Oct 2020 15:05:38 GMT

```
{
  "account": {"iban": "DE2310010010123456788"},
  "transactions": {
    "booked": [
      {
        "transactionId": "d8c2dfcf-3187-4e67-b5cd-b1953923a0b9",
```

```

        "transactionAmount": {"currency": "EUR", "amount": "2000"},
        "bookingDate": "2020-10-01",
        "valueDate": "2020-10-02",
        "remittanceInformationUnstructured": "Example 1"
    }, {
        "transactionId": "d7b9f311-4813-4582-aa0f-0b913bab0a34",
        "transactionAmount": {"currency": "EUR", "amount": "2000"},
        "bookingDate": "2020-10-09",
        "valueDate": "2020-10-10",
        "remittanceInformationUnstructured": "Example 2"
    }
],
"pending": [
    {
        "transactionId": "d7b9f311-4813-4582-aa0f-0b913bab0a35",
        "transactionAmount": {"currency": "EUR", "amount": "2000"},
        "valueDate": "2020-10-30",
        "remittanceInformationUnstructured": "Example 4"
    }
]
}
}

```

4.4 Endpoints for Loans (XAIS-LOAN)

4.4.1 Read Account List

4.4.1.1 Request

Call

GET /v2/loans

Reads a list of loan accounts. The ASPSP may choose to provide information on balances in the response. It is assumed that a consent of the PSU to this access is already given and stored on the ASPSP system. The addressed list of accounts depends then on the PSU ID and the consent addressed by consentId, respectively the OAuth2 access token.

Note: If the consent is granted only to show the list of addressable accounts, much less details are displayed about the accounts. Specifically hyperlinks to additional resources such as balances or transaction endpoint should not be delivered then.

Note: In case of corresponding access rights granted by the consent, additional details might be retrieved by addressing the /loans/{account-id} endpoint, cp. Section 4.4.2.

Path Parameters

No path parameters defined.

Query Parameters

No query parameters defined.

Request Header

Attribute	Type	Condition	Description
X-Request-ID	UUID	Mandatory	ID of the request, unique to the call, as determined by the initiating party. The X-Request-ID serves as an impotency key.
Consent-ID	Max70Text	Mandatory	Consent-Id as obtained during consent establishment for the consent resulting from the "Establish Consent on Account Information" performed via this API before.
PSU-IP-Address	String	Conditional	The forwarded IP Address header field consists of the corresponding HTTP request IP Address field between PSU and TPP. It shall be contained if and only if this request was actively initiated by the PSU.
Authorization	String	Conditional	Is contained only, if an OAuth2 based authentication was performed in a pre-step or an OAuth2 based SCA was performed in the related consent authorisation.
API-Contract-ID	UUID	Conditional	Might be mandated by ASPSP or business rules of related API access schemes. ID of the underlying API service contract between API Client and API Server, resulting from API Client onboarding, following [oFA-IG-ADM]. The API-Contract-ID may differ from the API-Contract-ID used during consent establishment of the consent referenced in header field Consent-ID, e.g. in case of a change of relevant commercial conditions after consent establishment.

Request Body

No request body.

4.4.1.2 Response

Response Code

The HTTP response code equals 200.

Response Header

Attribute	Type	Condition	Description
X-Request-ID	UUID	Mandatory	ID of the request, unique to the call, as determined by the initiating party.

Response Body

Attribute	Type	Condition	Description
accounts	Array of Account Details	Mandatory	In case, no account is accessible, the ASPSP shall return an empty array. As this is also considered a positive response, the Response code must still be 200. Please note that some attributes of an Account Details object are only supported for specific account types. For Details, see [oFA DaD].

4.4.1.3 Examples

Request

GET https://api.testbank.com/v2/loans/accounts

```
Accept: application/json
X-Request-ID: 99391c7e-ad88-49ec-a2ad-99ddcb1f7756
Consent-ID: 8bd44685-026d-4484-8cc2-243d4f0b04ff
Date: Thu, 29 Oct 2020 15:05:37 GMT
API-Contract-ID: 3bd7ccec-6510-4907-909d-2fbc0fc5f0f0
```

Response

```
HTTP/1.x 200 Ok
X-Request-ID: 99391c7e-ad88-49ec-a2ad-99ddcb1f7756
Content-Type: application/json
Date: Thu, 29 Oct 2020 15:05:38 GMT
```

```

{
  "accounts": [
    {
      "resourceId": "5dc3d5b3-7023-4848-9853-f5400a64e81g",
      "other": {"identification": "MyProprietaryID-0003"},
      "currency": "EUR",
      "ownerName": "Paul Simpson",
      "name": "Silver",
      "product": "Retail loan",
      "cashAccountType": "LOAN",
      "interest": [
        {
          "type": "FIXD",
          "rate": [
            {"percentage": "4.5"}
          ],
          "toDateTime": "2021-01-05T23:59:59"
        }
      ],
      "relatedDates": {
        "contractStartDate": "2017-01-01",
        "contractEndDate": "2023-01-01",
        "contractAvailabilityDate": "2020-01-01"
      },
      "collateralsInvolved": false,
      "balances": [
        {
          "balanceAmount": {"currency": "EUR", "amount": "-80000.00"},
          "balanceType": "closingBooked",
          "referenceDate": "2020-10-30"
        }
      ],
      "_links": {
        "balances": {
          "href": "/v2/loans/3dc3d5b3-7023-4848-9853-f5400a64e81g/balances"
        },
        "transactions": {
          "href": "/v2/loans/3dc3d5b3-7023-4848-9853-f5400a64e81g/transactions"
        }
      }
    }, {
      "resourceId": "3dc3d5b3-7023-4848-9853-f5400a64e816",
      "other": {"identification": "MyProprietaryID-0004"},
      "currency": "EUR",
      "ownerName": "Paul Simpson",
      "name": "Silver",
      "product": "Retail loan",
      "cashAccountType": "LOAN",

```

```

    "interest": [
      {
        "type": "FIXD",
        "rate": [
          {"percentage": "4.5"}
        ],
        "toDateTime": "2021-01-05T23:59:59"
      }
    ],
    "relatedDates": {
      "contractStartDate": "2017-01-01",
      "contractEndDate": "2023-01-01",
      "contractAvailabilityDate" : "2020-01-01"
    },
    "collateralsInvolved": false,
    "balances": [
      {
        "balanceAmount": {"currency": "USD", "amount": "-10000.00"},
        "balanceType": "closingBooked",
        "referenceDate": "2020-10-30"
      }
    ],
    "_links": {
      "balances": {
        "href": "/v2/loans/5dc3d5b3-7023-4848-9853-f5400a64e816/balances"
      },
      "transactions": {
        "href": "/v2/loans/5dc3d5b3-7023-4848-9853-f5400a64e816/transactions"
      }
    }
  }, {
    "resourceId": "5dc3d5b3-10a4-4848-9853-f5400a64e82g",
    "iban": "DE40100100103307118608",
    "currency": "EUR",
    "ownerName": "Paul Simpson",
    "name": " Happy Home 2008",
    "product": "Mortgage loan",
    "cashAccountType": "LOAN",
    "interest": [
      {
        "type": "FIXD",
        "rate": [
          {"percentage": "2.0"}
        ],
        "toDateTime": "2039-12-31T23:59:59"
      }
    ],
    "relatedDates": {

```

```

    "contractStartDate": "2020-01-01",
    "contractEndDate": "2040-01-01",
    "contractAvailabilityDate" : "2030-01-01"
  },
  "collateralsInvolved": false,
  "balances": [
    {
      "balanceAmount": {"currency": "EUR", "amount": "-100000.00"},
      "balanceType": "closingBooked",
      "referenceDate": "2020-10-01"
    }
  ],
  "_links": {
    "balances": {
      "href": "/v2/loans/5dc3d5b3-10a4-4848-9853-f5400a64e82g/balances"
    },
    "transactions": {
      "href": "/v2/loans/5dc3d5b3-10a4-4848-9853-f5400a64e82g/transactions"
    }
  }
}
]
}

```

4.4.2 Read Account Details

4.4.2.1 Request

Call

GET /v2/loans/{account-id}

Reads details about a loan account. The ASPSP may choose to provide information on balances in the response. It is assumed that a consent of the PSU to this access is already given and stored on the ASPSP system. The addressed list of accounts depends then on the PSU ID and the consent addressed by consentId, respectively the OAuth2 access token.

Path Parameters

Attribute	Type	Description
account-id	Max70Text	This identification is denoting the addressed account. The account-id is retrieved by a (successful) "Read Account List" request as described in section 4.5.1. The account-id is the "resourceId" attribute of the account structure. Its value is constant at least throughout the lifecycle of a given consent.

Query Parameters

No query parameters defined.

Request Header

The same requirements towards request headers apply as for the "Read Account List" request (see section 4.4.1).

Request Body

No request body.

4.4.2.2 Response

Response Code

HTTP Response Code equals 200.

Response Header

Attribute	Type	Condition	Description
X-Request-ID	UUID	Mandatory	ID of the request, unique to the call, as determined by the initiating party.

Response Body

Attribute	Type	Condition	Description
account	Account Details	Mandatory	Description of the addressed account.

4.4.2.3 Example

Request

GET <https://api.testbank.com/v2/loans/5dc3d5b3-7023-4848-9853-f5400a64e81g>

```
Accept: application/json
X-Request-ID: 99391c7e-ad88-49ec-a2ad-99ddcb1f7756
Consent-ID: 8bd44685-026d-4484-8cc2-243d4f0b04ff
Date: Thu, 29 Oct 2020 15:05:37 GMT
API-Contract-ID: 3bd7cc5c-6510-4907-909d-2fbc0fc5f0f0
```

Response

HTTP/1.x 200 Ok

X-Request-ID: 99391c7e-ad88-49ec-a2ad-99ddcb1f7756

Content-Type: application/json

Date: Thu, 29 Oct 2020 15:05:38 GMT

```

{
  "account": {
    "resourceId": "5dc3d5b3-7023-4848-9853-f5400a64e81g",
    "iban": "DE2310010010123456788",
    "currency": "EUR",
    "ownerName": "Paul Simpson",
    "name": " Silver",
    "product": "Retail loan",
    "cashAccountType": "LOAN",
    "status": "enabled",
    "interest": [
      {
        "type": "FIXD" ,
        "rate": [
          {"percentage": "4.5"}
        ],
        "toDateTime": "2021-01-05T23:59:59"
      }
    ],
    "relatedDates": {
      "contractStartDate": "2017-01-01",
      "contractEndDate": "2023-01-01",
      "contractAvailabilityDate" : "2020-01-01"
    },
    "collateralsInvolved": false,
    "balances": [
      {
        "balanceAmount": {"currency": "EUR", "amount": "-80000.00"},
        "balanceType": "closingBooked",
        "referenceDate": "2020-10-01"
      }
    ],
    "_links": {
      "balances": {
        "href": "/v2/loans/5dc3d5b3-7023-4848-9853-f5400a64e81g/balances"
      },
      "transactions": {
        "href": "/v2/loans/5dc3d5b3-7023-4848-9853-f5400a64e81g/transactions"
      }
    }
  }
}

```

```
}
```

4.4.3 Read Account Balances

4.4.3.1 Request

Call

```
GET /v2/loans/{account-id}/balances
```

Reads balance data from a given loan account addressed by "account-id".

Note: The original balance of the loan at the start date might be provided e.g. by a balance of type "openingBooked" and the referenceDate of the loan starting date.

Path Parameters

Attribute	Type	Description
account-id	Max70Text	This identification is denoting the addressed account. The account-id is retrieved by a (successful) "Read Account List" request as described in section 4.4.1. The account-id is the "resourceId" attribute of the account structure. Its value is constant at least throughout the lifecycle of a given consent.

Query Parameters

No query parameters defined.

Request Header

The same requirements towards request headers apply as for the "Read Account List" request (see section 4.4.1).

Request Body

No request body.

4.4.3.2 Response

Response Code

HTTP Response Code equals 200.

Response Header

Attribute	Type	Condition	Description
X-Request-ID	UUID	Mandatory	ID of the request, unique to the call, as determined by the initiating party.

Response Body

Attribute	Type	Condition	Description
account	Account Reference	Mandatory	Identifier of the addressed account.
balances	Array of Balance	Mandatory	For the usage and interpretation of the balance type, compare section 3.2.3. Remark: The historic balance of the loan can be provided by returning a balance of any type together with the respective referenceDate. This applies specifically to the original loan amount by using the starting date as reference.

4.4.3.3 Examples**Request**

GET https://api.testbank.com/v2/loans/5dc3d5b3-7023-4848-9853-f5400a64e81g

Accept: application/json
 X-Request-ID: 99391c7e-ad88-49ec-a2ad-79ddcb1f7756
 Consent-ID: 8bd44685-026d-4484-8cc2-243d4f0b04ff
 Date: Thu, 29 Oct 2020 15:05:37 GMT
 API-Contract-ID: 3bd7cc5c-6510-4907-909d-2fbc0fc5f0f0

Response

HTTP/1.x 200 Ok
 X-Request-ID: 99391c7e-ad88-49ec-a2ad-79ddcb1f7756
 Content-Type: application/json
 Date: Thu, 29 Oct 2020 15:05:38 GMT

```
{
  "account": {"iban": "DE2310010010123456788"},
  "balances": [
```

```

{
  "balanceAmount": {"currency": "EUR", "amount": "-80000.00"},
  "balanceType": "closingBooked",
  "referenceDate": "2020-10-01"
}, {
  "balanceAmount": {"currency": "EUR", "amount": "-82500.00"},
  "balanceType": "expected",
  "lastChangeDateTime": "2020-11-20T15:30:35.035Z"
}
]
}

```

4.4.4 Read Transaction List

4.4.4.1 Request

Call

GET /v2/loans/{account-id}/transactions

Reads transaction data from a given loan account addressed by "account-id".

Note: The ASPSP might use standard compression methods on application level for the response message as indicated in the content encoding header.

Remark: Please note that the PATH might be already given in detail by the response of the "Read Account List" call within the `_links` subfield.

Path Parameters

Attribute	Type	Description
account-id	Max70Text	This identification is denoting the addressed account. The account-id is retrieved by a (successful) "Read Account List" request as described in section 4.3.1. The account-id is the "resourceId" attribute of the account structure. Its value is constant at least throughout the lifecycle of a given consent.

Query Parameters

Attribute	Type	Condition	Description
dateFrom	ISODate	Conditional	Starting date (inclusive the date dateFrom) of the transaction list, mandated if no delta access is required and if bookingStatus does not equal "information".

Attribute	Type	Condition	Description
			In the case of booked transactions, the relevant date is the booking date. In the case of pending transactions, the relevant date is the entry date, which may not be transparent neither in this API nor other channels of the ASPSP.
dateTo	ISODate	Optional	End date (inclusive the date dateTo) of the transaction list, default is "now" if not given. Might be ignored if a delta function is used. "dateTo" is always applied to the same date as "dateFrom" (see previous row).
entryReferenceFrom	String	Optional if supported by API provider	This data attribute is indicating that the API Client is in favour to get all transactions after the transaction with identification entryReferenceFrom alternatively to the above defined period. This is an implementation of a delta access. If this data element is contained, the entries "dateFrom" and "dateTo" might be ignored by the ASPSP if a delta report is supported.
bookingStatus	String	Mandatory	Usage of an unsupported value for bookingStatus (context sensitive, see descriptions below) shall result in a response with the corresponding error code (PARAMETER_NOT_SUPPORTED). Permitted codes are "booked", "pending", "both", "information" and "all". "booked" shall be supported by the ASPSP. To support the "pending", "both", "information" or "all" feature is optional for the ASPSP. If supported, "both" means to request transaction reports of transaction of bookingStatus either "pending" or "booked", "information" means that the response shall contain the expected amortisations for this loan account. "all" means to request lists of transaction of any bookingStatus ("pending", "booked" or "information").

Attribute	Type	Condition	Description
deltaList	Boolean	Optional if supported by API provider	This data attribute is indicating that the API Client is in favour to get all transactions after the last report access for this PSU on the addressed account. This is another implementation of a delta access-report. This delta indicator might be rejected by the ASPSP if this function is not supported. If this data element is contained, the entries "dateFrom" and "dateTo" might be ignored by the ASPSP if a delta report is supported.

Request Header

With the exception of the "Accept" header, the same requirements towards request headers apply as for the "Read Account List" request (see section 4.3.1):

Attribute	Type	Condition	Description
X-Request-ID	UUID	Mandatory	ID of the request, unique to the call, as determined by the initiating party.
PSU-IP-Address	String	Conditional	The forwarded IP Address header field consists of the corresponding HTTP request IP Address field between PSU and TPP. It shall be contained if and only if this request was actively initiated by the PSU.
Consent-ID	Max70Text	Mandatory	
Authorization	String	Conditional	Is contained only, if an OAuth2 based authentication was performed in a pre-step or an OAuth2 based SCA was performed in the related consent authorisation.
Accept	String	Optional	The TPP can indicate the formats of account reports supported together with a prioritisation following the HTTP header definition. The formats supported by this specification are • xml • JSON • text

Attribute	Type	Condition	Description
API-Contract-ID	UUID	Conditional	Might be mandated by ASPSP or business rules of related API access schemes. ID of the underlying API service contract between API Client and API Server, resulting from API Client onboarding, following [oFA-IG-ADM]. The API-Contract-ID may differ from the API-Contract-ID used during consent establishment of the consent referenced in header field Consent-ID, e.g. in case of a change of relevant commercial conditions after consent establishment.

Remark: The Berlin Group intends to apply for vnd-entries within the "accept" attribute for camt.05x and MT94x formats to scope with different account report formats available for the PSU e.g. in a corporate context. These values will be added to this specification as soon as available. This will then lead to expressions like /application/vnd.BerlinGroup.camt.053+xml etc. The TPP then could e.g. say: "I prefer camt.054, but take camt.053 if this is not available." This solution is recommended as a best practice until it is fully specified. In this example this would deliver the following accept header expression:

```
Accept: /application/vnd.BerlinGroup.camt.054+xml;q=0.9,
/application/vnd.BerlinGroup.camt.053+xml;q=0.8
```

In addition, these best practices allow to differentiate technical sub versions of camt, i.e. it could be stated that "I prefer camt.054.001.08 (the new sub version), but take (the older sub version) camt.054.001.02 if this is not available." This is to support ASPSPs in migrating the technical camt formats.

```
Accept: /application/vnd.BerlinGroup.camt.054.001.08+xml;q=0.9,
application/vnd.BerlinGroup.camt.054.001.02+xml;q=0.8
```

Request Body

No request body.

4.4.4.2 Response

Response Code

HTTP Response Code equals 200.

Response Header

Attribute	Type	Condition	Description
X-Request-ID	UUID	Mandatory	ID of the request, unique to the call, as determined by the initiating party.

Response Body

If the ASPSP returns a **camt.05x** XML structure, the response body consists of either a camt.052 or camt.053 format. The camt.052 may include pending payments which are not yet finally booked. The ASPSP will decide on the format due to the chosen parameters, specifically on the chosen dates relative to the time of the request. In addition the ASPSP might offer camt.054x structure e.g. in a corporate setting.

If the ASPSP returns a **MT94x** content, the response body consists of an MT940 or MT942 format in a text structure. The MT942 may include pending payments which are not yet finally booked. The ASPSP will decide on the format due to the chosen parameters, specifically on the chosen dates relative to the time of the request.

A JSON response is defined as follows:

Attribute	Type	Condition	Description
account	Account Reference	Mandatory	Identifier of the addressed account.
transactions	Account Report	Optional	JSON based account report. This account report contains transactions resulting from the query parameters.
balances	Array of Balance	Optional	A list of balances regarding this account, which might be restricted to the current balance.
_links	Links	Optional	A list of hyperlinks to be recognised by the TPP. Type of links admitted in this response: "download": a link to a resource, where the transaction report might be downloaded from in case where transaction reports have a huge size. Remark: This feature shall only be used where camt-data is requested which has a huge size.

4.4.4.3 Example

Request

GET https://api.testbank.com/v2/loans/5dc3d5b3-7023-4848-9853-f5400a64e81g/transactions?dateFrom=2020-08-30&dateTo=2020-10-31&bookingStatus=both

Accept: application/json
 X-Request-ID: 90391c7e-ad88-49ec-a2ad-99ddcb1f7721
 Consent-ID: 8bd44685-026d-4484-8cc2-243d4f0b04ff
 Date: Thu, 29 Oct 2020 15:05:37 GMT
 API-Contract-ID: 3bd7ccec-6510-4907-909d-2fbc0fc5f0f0

Response

HTTP/1.x 200 Ok

X-Request-ID: 90391c7e-ad88-49ec-a2ad-99ddcb1f7721
 Date: Thu, 29 Oct 2020 15:05:38 GMT
 Content-Type: application/json

```
{
  "loanAccount": {"iban": "DE2310010010123456788"},
  "transactions": {
    "booked": [
      {
        "transactionId": "d8c2dfcf-3187-4e67-b5cd-b1953923a0b9",
        "transactionAmount": {"currency": "EUR", "amount": "1250"},
        "bookingDate": "2020-08-30",
        "valueDate": "2020-08-31",
        "remittanceInformationUnstructured": "Amortisation Aug 2020"
      }, {
        "transactionId": "d8c2dfcf-3187-4e67-b5cd-b1953923a0b8",
        "transactionAmount": {"currency": "EUR", "amount": "1250"},
        "bookingDate": "2020-09-29",
        "valueDate": "2020-09-30",
        "remittanceInformationUnstructured": "Amortisation Sep 2020"
      }, {
        "transactionId": "d7b9f311-4813-4582-aa0f-0b913bab0a34",
        "transactionAmount": {"currency": "EUR", "amount": "-10.00"},
        "bookingDate": "2020-09-30",
        "valueDate": "2020-09-30",
        "remittanceInformationUnstructured": "Interest Q3 2020"
      }
    ],
    "pending": [
      {
        "transactionId": "d8c2dfcf-3187-4e67-b5cd-b1953923a0b6",
        "transactionAmount": {"currency": "EUR", "amount": "1250"},

```

```
        "valueDate": "2020-10-31",
        "remittanceInformationUnstructured": "Amortisation Oct 2020"
    }
  ]
}
}
```

4.5 Endpoints for Securities Accounts (XAIS-SEC)

4.5.1 Read Account List

4.5.1.1 Request

Call

GET /v2/securities-accounts

Reads a list of securities accounts. It is assumed that a consent of the PSU to this access is already given and stored on the ASPSP system. The addressed list of accounts depends then on the PSU ID and the consent addressed by consentId, respectively the OAuth2 access token.

Note: If the consent is granted only to show the list of addressable accounts, much less details are displayed about the accounts. Specifically hyperlinks to additional resources such as balances or transaction endpoint should not be delivered then.

Note: In case of corresponding access rights granted by the consent, additional details might be retrieved by addressing the /securities-accounts/{account-id} endpoint, cp. Section 4.5.2.

Path Parameters

No path parameters defined.

Query Parameters

Attribute	Type	Condition	Description
evaluationCurrency	String	Optional	ISO Alpha-3 currency code to request evaluation of the balances in a specific currency. This query parameter might be ignored by the ASPSP, if evaluation is not supported for variable currencies or does not support evaluation in the requested currency.

Request Header

Attribute	Type	Condition	Description
X-Request-ID	UUID	Mandatory	ID of the request, unique to the call, as determined by the initiating party. The X-Request-ID serves as an impotency key.
Consent-ID	Max70Text	Mandatory	Consent-Id as obtained during consent establishment for the consent resulting from the "Establish Consent on Account Information" performed via this API before.
PSU-IP-Address	String	Conditional	The forwarded IP Address header field consists of the corresponding HTTP request IP Address field between PSU and TPP. It shall be contained if and only if this request was actively initiated by the PSU.
Authorization	String	Conditional	Is contained only, if an OAuth2 based authentication was performed in a pre-step or an OAuth2 based SCA was performed in the related consent authorisation.
API-Contract-ID	UUID	Conditional	Might be mandated by ASPSP or business rules of related API access schemes. ID of the underlying API service contract between API Client and API Server, resulting from API Client onboarding, following [oFA-IG-ADM]. The API-Contract-ID may differ from the API-Contract-ID used during consent establishment of the consent referenced in header field Consent-ID, e.g. in case of a change of relevant commercial conditions after consent establishment.

Request Body

No request body.

4.5.1.2 Response

Response Code

The HTTP response code equals 200.

Response Header

Attribute	Type	Condition	Description
X-Request-ID	UUID	Mandatory	ID of the request, unique to the call, as determined by the initiating party.

Response Body

Attribute	Type	Condition	Description
accounts	Array of Account Details	Mandatory	In case, no account is accessible, the ASPSP shall return an empty array. As this is also considered a positive response, the Response code must still be 200. Please note that some attributes of an Account Details object are only supported for specific account types. For Details, see [oFA DaD].

4.5.1.3 Example**Request**

GET https://api.testbank.com/v2/securities-accounts?evaluationCurrency=EUR

Accept: application/json
 X-Request-ID: 99391c7e-ad88-49ec-a2ad-99ddcb1f7756
 Consent-ID: 8bd44685-026d-4484-8cc2-243d4f0b04ff
 Date: Thu, 29 Oct 2020 15:05:37 GMT
 API-Contract-ID: 3bd7ccec-6510-4907-909d-2fbc0fc5f0f0

Response

HTTP/1.x 200 Ok
 X-Request-ID: 99391c7e-ad88-49ec-a2ad-99ddcb1f7756
 Content-Type: application/json
 Date: Thu, 29 Oct 2020 15:05:38 GMT

```
{
  "accounts": [
    {
      "resourceId": "3dc3d5b3-7023-4848-9853-f5400a64e81g",
      "other": {"identification": "MyProprietaryID-0001"},
      "currency": "EUR",
```

```

"ownerName": "Paul Simpson",
"name": "Securities 1a",
"balances": [
  {
    "balanceAmount" : {"currency" : "EUR", "amount" : "22901.00"},
    "balanceType": "closingBooked"
  }, {
    "balanceAmount": {"currency" : "EUR", "amount" : "22910.00"},
    "balanceType": "interimAvailable",
    "referenceDateTime" : "2020-10-29T14:00:00.011Z"
  }
],
"_links": {
  "securitiesAccount": {
    "href": "/v2/securities-accounts/3dc3d5b3-7023-4848-9853-f5400a64e81g"
  },
  "positions": {
    "href": "/v2/securities-accounts/3dc3d5b3-7023-4848-9853-f5400a64e81g/positions"
  },
  "transactions": {
    "href": "/v2/securities-accounts/3dc3d5b3-7023-4848-9853-f5400a64e81g/transactions"
  },
  "orders": {
    "href": "/v2/securities-accounts/3dc3d5b3-7023-4848-9853-f5400a64e81g/orders"
  }
}, {
  "resourceId": "3dc3d5b3-7023-4848-9853-f5400a64e813",
  "other": {"identification": "MyProprietaryID-0002"},
  "currency": "EUR",
  "ownerName": "Paul Simpson",
  "name": "Securities 1b",
  "balances": [
    {
      "balanceAmount" : {"currency" : "EUR", "amount" : "1000.00"},
      "balanceType": "closingBooked"
    }, {
      "balanceAmount": {"currency" : "EUR", "amount" : "987.60"},
      "balanceType": "interimAvailable",
      "referenceDateTime" : "2020-10-29T14:00:00.011Z"
    }
  ],
  "_links": {
    "securitiesAccount": {

```



```
      "href": "/v2/securities-accounts/3dc3d5b3-7023-4848-9853-  
f5400a64e813 "  
    },  
    "positions": {  
      "href": "/v2/securities-accounts/3dc3d5b3-7023-4848-9853-  
f5400a64e813/positions"  
    },  
    "transactions": {  
      "href": "/v2/securities-accounts/3dc3d5b3-7023-4848-9853-  
f5400a64e813/transactions"  
    },  
    "orders": {  
      "href": "/v2/securities-accounts/3dc3d5b3-7023-4848-9853-  
f5400a64e813/orders"  
    }  
  }  
}  
]  
}
```

4.5.2 Read Account Details

4.5.2.1 Request

Call

GET /v2/securities-accounts/{account-id}

Reads details about a securities account. It is assumed that a consent of the PSU to this access is already given and stored on the ASPSP system. The addressed list of accounts depends then on the PSU ID and the consent addressed by consentId, respectively the OAuth2 access token.

Path Parameters

Attribute	Type	Description
account-id	Max70Text	This identification is denoting the addressed account. The account-id is retrieved by a (successful) "Read Account List" request as described in section 4.5.1. The account-id is the "resourceId" attribute of the account structure. Its value is constant at least throughout the lifecycle of a given consent.

Query Parameters

Attribute	Type	Condition	Description
evaluationCurrency	String	Optional	ISO Alpha-3 currency code to request evaluation of the balances in a specific currency. This query parameter might be ignored by the ASPSP, if evaluation is not supported for variable currencies or does not support evaluation in the requested currency.

Request Header

The same requirements towards request headers apply as for the "Read Account List" request (see section 4.5.1).

Request Body

No request body.

4.5.2.2 Response

Response Code

HTTP Response Code equals 200.

Response Header

Attribute	Type	Condition	Description
X-Request-ID	UUID	Mandatory	ID of the request, unique to the call, as determined by the initiating party.

Response Body

Attribute	Type	Condition	Description
account	Account Details	Mandatory	Description of the addressed account.

4.5.2.3 Example

Request

GET https://api.testbank.com/v2/securities-accounts/3dc3d5b3-7023-4848-9853-f5400a64e81g?evaluationCurrency=EUR

Accept: application/json
X-Request-ID: 99391c7e-ad88-49ec-a2ad-99ddcb1f7757
Consent-ID: 8bd44685-026d-4484-8cc2-243d4f0b04ff
Date: Thu, 29 Oct 2020 15:05:37 GMT
API-Contract-ID: 3bd7ccec-6510-4907-909d-2fbc0fc5f0f0

Response

HTTP/1.x 200 Ok
X-Request-ID: 99391c7e-ad88-49ec-a2ad-99ddcb1f7757
Content-Type: application/json
Date: Thu, 29 Oct 2020 15:05:38 GMT

```
{
  "account": {
    "resourceId": "3dc3d5b3-7023-4848-9853-f5400a64e81g",
    "other": {
      "identification": "123456789012",
      "schemeNameProprietary": "Depotnummer",
      "issuer": "testbank"
    },
    "ownerName": "Paul Simpson",
    "name": "Securities 1",
    "product": "Securities Account",
    "status": "enabled",
    "applicableFees": [
      {
        "typeCode": "managementFee",
        "feeRules": [
          { "amount": { "currency": "EUR", "amount": "10.00" } }
        ]
      },
      {
        "typeCode": "courtage",
        "feeRules": [
          {
            "toBaseAmount": { "currency": "EUR", "amount": "19999.99" },
            "percentage": "1.0",
            "minimumAmount": { "currency": "EUR", "amount": "10.00" }
          },
          {
            "fromBaseAmount": { "currency": "EUR", "amount": "20000.00" },

```

```

        "percentage": "0.8",
        "maximumAmount": {"currency": "EUR", "amount": "300.00"}
    }
]
},
"balances": [
    {
        "balanceAmount" : {"currency" : "EUR", "amount" : "22901.00"},
        "balanceType": "closingBooked"
    }, {
        "balanceAmount": {"currency" : "EUR", "amount" : "22910.00"},
        "balanceType": "interimAvailable",
        "referenceDateTime" : "2020-10-29T14:00:00.011Z"
    }
],
"_links": {
    "positions": {
        "href": "/v2/securities-accounts/3dc3d5b3-7023-4848-9853-
f5400a64e81g/positions"
    },
    "transactions": {
        "href": "/v2/securities-accounts/3dc3d5b3-7023-4848-9853-
f5400a64e81g/transactions"
    },
    "orders": {
        "href": "/v2/securities-accounts/3dc3d5b3-7023-4848-9853-
f5400a64e81g/orders"
    }
}
}
}

```

4.5.3 Read Account Positions

4.5.3.1 Request

Call

GET /v2/securities-accounts/{account-id}/positions

This message reads the portfolio of a securities account.

Path Parameters

Attribute	Type	Description
account-id	Max70Text	This identification is denoting the addressed account. The account-id is retrieved by a (successful) "Read Account List" request as described in section 4.5.1. The account-id is the "resourceId"

Attribute	Type	Description
		attribute of the account structure. Its value is constant at least throughout the lifecycle of a given consent.

Query Parameters

No query parameters defined.

Request Header

The same requirements towards request headers apply as for the "Read Account List" request (see section 4.5.1).

Request Body

No request body.

4.5.3.2 Response

Response Code

HTTP Response Code equals 200.

Response Header

Attribute	Type	Condition	Description
X-Request-ID	UUID	Mandatory	ID of the request, unique to the call, as determined by the initiating party.

Response Body

Attribute	Type	Condition	Description
account	Account Reference	Mandatory	Identifier of the addressed (securities) account.
reportDateTime	ISODateTime	Mandatory	Date and time of the report. That is, all listed positions are provided in their quantity within the account as reflected by the ASPSP at the reportDateTime. Might differ from the current date and time in situations where a real time information of the deposit's positions is not available.

Attribute	Type	Condition	Description
balances	Array of Balance	Optional	Calculated value of all securities in account currency. For the usage of "Balance" items compare section 3.2.3.
positionList	Array of Securities Position	Mandatory	If the deposit does not contain any positions, the "positionList" element must contain an empty array.

4.5.3.3 Example

Request

GET <https://api.testbank.com/v2/securities-accounts/3dc3d5b3-7023-4848-9853-f5400a64e81g/positions>

Accept: application/json
X-Request-ID: 99391c7e-ad88-49ec-a2ad-99ddcb1f7756
Consent-ID: 8bd44685-026d-4484-8cc2-243d4f0b04ff
Date: Fri, 25 Mar 2022 15:05:37 GMT
API-Contract-ID: 3bd7ccec-6510-4907-909d-2fbc0fc5f0f0

Response

HTTP/1.x 200 Ok
X-Request-ID: 99391c7e-ad88-49ec-a2ad-99ddcb1f7756
Content-Type: application/json
Date: Fri, 25 Mar 2022 15:05:38 GMT

```
{
  "account": {"iban": "DE2310010010123456788"}
  "reportDateTime": "2022-03-25T00:00:00.000Z"
  "balances": [
    {
      "balanceAmount": {"currency": "EUR", "amount": "22901.00"},
      "balanceType": "closingBooked"
    }, {
      "balanceAmount": {"currency": "EUR", "amount": "22910.00"},
      "balanceType": "interimAvailable",
      "referenceDateTime": "2020-10-29T14:00:00.011Z"
    }
  ],
  "positionList": [
    {
      "financialInstrument": {
        "isin": "DE000BASF111",
```

```

    "name": "BASF SE Namens-Aktien o.N.",
    "normalisedPrice": {
      "amount": {"currency": "EUR", "amount": "70.88"},
      "priceDateTime" : "2022-03-25T00:00:00.000Z",
      "priceType" : "MRKT",
      "sourceOfPrice" : {"type": "LMAR", "mic": "XETR"}
    }
  },
  "unitsNumber": 100,
  "balanceType": "AVAI",
  "averageBuyingPrice": {"currency": "EUR", "amount": "60.17"}
}, {
  "financialInstrument": {
    "isin": "DE000A0Z2ZZ5",
    "name": "freenet AG Namens-Aktien o.N.",
    "normalisedPrice": {
      "amount": {"currency": "EUR", "amount": "29.88"},
      "priceDateTime" : "2022-03-25T00:00:00.000Z",
      "priceType" : "MRKT",
      "sourceOfPrice" : {"type": "LMAR", "mic": "XETR"}
    }
  },
  "unitsNumber": 200,
  "balanceType": "AVAI",
  "averageBuyingPrice": {"currency": "EUR", "amount": "30.17"}
}, {
  "financialInstrument": {
    "isin": "XS1893631769",
    "name": "VOLKSWAGEN FINANCIAL SERVICES AG 2,25% 18/26",
    "normalisedPrice": {
      "percentage": "99.855",
      "priceDateTime" : "2022-03-25T00:00:00.000Z",
      "priceType" : "MRKT",
      "sourceOfPrice" : {"type": "LMAR", "mic": "XETR"}
    }
  },
  "unitsNominal": {"currency": "EUR", "amount": "10000.00"},
  "balanceType": "AVAI",
  "totalBuyingPrice": {"currency": "EUR", "amount": "10100.00"}
}
]
}

```

4.5.4 Read Transaction List

4.5.4.1 Request

Call

GET /v2/securities-accounts/{account-id}/transactions

Reads transaction data from a given account addressed by "account-id". The provided transaction list contains the movements of positions that have already taken place. These movement might be the result of buying or selling financial instruments as well as other movements (such as borrowing or lending). Orders that the PSU has placed for this account will not be reported under "transactions". Instead, orders will be available under an additional "orders" endpoint (see section 4.5.6).

Note: The ASPSP might use standard compression methods on application level for the response message as indicated in the content encoding header.

Remark: Please note that the PATH might be already given in detail by the response of the "Read Account List" call within the _links subfield.

Path Parameters

Attribute	Type	Description
account-id	Max70Text	This identification is denoting the addressed account. The account-id is retrieved by a (successful) "Read Account List" request as described in section 4.5.1. The account-id is the "resourceId" attribute of the account structure. Its value is constant at least throughout the lifecycle of a given consent.

Query Parameters

Attribute	Type	Condition	Description
dateFrom	ISODate	Conditional	Starting date (inclusive the date dateFrom) of the transaction list, mandated if no delta access is required and if bookingStatus does not equal "information". "dateFrom" always relates to one of the dates covered by element "relevantDates". The ASPSP shall provide a documentation, which type of date is used.
dateTo	ISODate	Optional	End date (inclusive the date dateTo) of the transaction list, default is "now" if not given. Might be ignored if a delta function is used.

Attribute	Type	Condition	Description
			"dateTo" is always applied to the same date as "dateFrom" (see previous row).
entryReferenceFrom	String	Optional if supported by API provider	This data attribute is indicating that the API Client is in favour to get all transactions after the transaction with identification entryReferenceFrom alternatively to the above defined period. This is an implementation of a delta access. If this data element is contained, the entries "dateFrom" and "dateTo" might be ignored by the ASPSP if a delta report is supported.
deltaList	Boolean	Optional if supported by API provider	This data attribute is indicating that the API Client is in favour to get all transactions after the last report access for this PSU on the addressed account. This is another implementation of a delta access-report. This delta indicator might be rejected by the ASPSP if this function is not supported. If this data element is contained, the entries "dateFrom" and "dateTo" might be ignored by the ASPSP if a delta report is supported.

Request Header

The same requirements towards request headers apply as for the "Read Account List" request (see section 4.5.1).

Request Body

No request body.

4.5.4.2 Response

Response Code

HTTP Response Code equals 200.

Response Header

Attribute	Type	Condition	Description
X-Request-ID	UUID	Mandatory	ID of the request, unique to the call, as determined by the initiating party.

Response Body

Attribute	Type	Condition	Description
account	Account Reference	Mandatory	Identifier of the addressed account.
transactions	Array of Securities Transaction	Optional	
_links	Links	Optional	A list of hyperlinks to be recognised by the TPP. Type of links admitted in this response: "first": Navigation link for paginated transaction lists. "next": Navigation link for paginated transaction lists. "previous": Navigation link for paginated transaction lists. "last": Navigation link for paginated transaction lists.

4.5.4.3 Example

Request

GET <https://api.testbank.com/v2/securities-accounts/3dc3d5b3-7023-4848-9853-f5400a64e81g/transactions?dateFrom=2022-03-01>

Accept: application/json
X-Request-ID: 99391c7e-ad88-49ec-a2ad-99ddcb1f7756
Consent-ID: 8bd44685-026d-4484-8cc2-243d4f0b04ff
Date: Fri, 25 Mar 2022 15:05:37 GMT
API-Contract-ID: 3bd7ccec-6510-4907-909d-2fbc0fc5f0f0

Response

HTTP/1.x 200 Ok

X-Request-ID: 99391c7e-ad88-49ec-a2ad-99ddcb1f7756

Content-Type: application/json

Date: Fri, 25 Mar 2022 15:05:38 GMT

```
{
  "account": {"iban": "DE2310010010123456788"},
  "transactions": [
    {
      "transactionId": "d8c2dfcf-3187-4e67-b5cd-b1953923a0b9",
      "relevantDates": [
        {
          "type": "transactionDate",
          "dateAndTime": "2022-02-28T17:00:05.000Z"
        }, {
          "type": "effectiveSettlementDate",
          "date": "2022-03-01"
        }
      ],
      "financialInstrument": {
        "isin": "DE000BASF111",
        "name": "BASF SE Namens-Aktien o.N."
      },
      "unitsNumber": 100,
      "_links": {
        "transactionDetails": {
          "href": "https://api.testbank.com/v2/securities-accounts/3dc3d5b3-7023-4848-9853-f5400a64e81g/transactions/transactions/d8c2dfcf-3187-4e67-b5cd-b1953923a0b9"
        }
      }
    }, {
      "transactionId": "d7b9f311-4813-4582-aa0f-0b913bab0a34",
      "relevantDates": [
        {
          "type": "effectiveSettlementDate",
          "date": "2022-03-01"
        }
      ],
      "financialInstrument": {
        "isin": "US1912161007",
        "name": "Coca-Cola Registered Shs"
      },
      "unitsNumber": -100,
      "_links": {
        "transactionDetails": {

```



```

        "href": "https://api.testbank.com/v2/securities-
accounts/3dc3d5b3-7023-4848-9853-f5400a64e81g /transactions/d7b9f311-4813-
4582-aa0f-0b913bab0a34"
    }
}
]
}

```

4.5.5 Read Transaction Details

4.5.5.1 Request

Call

```
GET /v2/securities-accounts/{account-id}/transactions/{transaction-id}
```

Reads transaction details from a given transaction addressed by "transactionId" on a given securities account addressed by "securities-account-id".

Path Parameters

Attribute	Type	Description
account-id	Max70Text	This identification is denoting the addressed account. The account-id is retrieved by a (successful) "Read Account List" request as described in section 4.5.1. The account-id is the "resourceId" attribute of the account structure. Its value is constant at least throughout the lifecycle of a given consent.
transaction-id	Max70Text	This identification is given by the attribute "transactionId" of the corresponding entry of a transaction list.

Query Parameters

No query parameters defined.

Request Header

The same requirements towards request headers apply as for the "Read Account List" request (see section 4.5.1).

Request Body

No request body.

4.5.5.2 Response

Response Code

HTTP Response Code equals 200.

Response Header

Attribute	Type	Condition	Description
X-Request-ID	UUID	Mandatory	ID of the request, unique to the call, as determined by the initiating party.

Response Body

Attribute	Type	Condition	Description
transactionDetails	Securities Transaction	Mandatory	

4.5.5.3 Example

Request

GET https://api.testbank.com/v2/securities-accounts/3dc3d5b3-7023-4848-9853-f5400a64e81g/transactions/d7b9f311-4813-4582-aa0f-0b913bab0a34

```
Accept: application/json
X-Request-ID: 99a91c7e-ad88-49ec-a2ad-99ddcb1f7756
Consent-ID: 8bd44685-026d-4484-8cc2-243d4f0b04ff
Date: Fri, 25 Mar 2022 15:05:37 GMT
API-Contract-ID: 3bd7ccec-6510-4907-909d-2fbc0fc5f0f0
```

Response

```
HTTP/1.x 200 Ok
X-Request-ID: 99a91c7e-ad88-49ec-a2ad-99ddcb1f7756
Content-Type: application/json
Date: Fri, 25 Mar 2022 15:05:38 GMT
```

```
{
  "transactionDetails":
  {
    "transactionId": "d7b9f311-4813-4582-aa0f-0b913bab0a34",
    "relevantDates": [
      {
```

```

        "type": "transactionDate",
        "dateAndTime": "2022-03-10T19:22:05.000Z"
    }, {
        "type": "effectiveSettlementDate",
        "date": "2022-03-01"
    }
],
"financialInstrument": {
    "isin": "US1912161007",
    "name": "Coca-Cola Registered Shs"
},
"unitsNumber": -100,
"placeOfTrade": {"mic": "XETR"},
"amountIncludesFees" : true,
"amountIncludesTaxes": false,
"amount": {"currency": "EUR", "amount": "5202.00"},
"unitsNumberBeforeTx": 100,
"unitsNumberAfterTx": 0
}
}

```

4.5.6 Read Securities Order List

4.5.6.1 Request

Call

GET /v2/securities-accounts/{account-id}/orders

Reads all orders that are still kept in the ASPSP's data base. The ASPSP may restrict the response values (e.g. restriction to all orders that are still active or all orders that were inactivated no earlier than last month). These restrictions must be documented by the ASPSP in its general documentation of the ASPSP's interface for securities.

Path Parameters

Attribute	Type	Description
account-id	Max70Text	This identification is denoting the addressed account. The account-id is retrieved by a (successful) "Read Account List" request as described in section 4.5.1. The account-id is the "resourceId" attribute of the account structure. Its value is constant at least throughout the lifecycle of a given consent.

Query Parameters

Attribute	Type	Condition	Description
dateFrom	ISODate	Mandatory	Starting date (inclusive the date dateFrom) of the order list. "dateFrom" always relates the creation date of the order.
dateTo	ISODate	Optional	End date (inclusive the date dateTo) of the order list, default is "now" if not given.
orderStatus	Comma separated list of Order Status Code	Optional	Restricts the result to orders that are currently assigned to one of the status values provided in this query parameter. If the parameter is not provided, orders are provided without restriction to their respective status.

Request Header

The same requirements towards request headers apply as for the "Read Account List" request (see section 4.5.1).

Request Body

No request body.

4.5.6.2 Response

Response Code

HTTP Response Code equals 200.

Response Header

Attribute	Type	Condition	Description
X-Request-ID	UUID	Mandatory	ID of the request, unique to the call, as determined by the initiating party.

Response Body

A JSON response is defined as follows:

Attribute	Type	Condition	Description
account	Account Reference	Optional	Identifier of the addressed securities account. Remark for Future: It is recommended to use this data element. The condition might change to "mandatory" in a next version of the specification.
orders	Array of Securities Order	Optional	List of orders placed for this securities account.
_links	Links	Optional	A list of hyperlinks to be recognised by the TPP. Type of links admitted in this response: "first": Navigation link for paginated order lists. "next": Navigation link for paginated order lists. "previous": Navigation link for order transaction lists. "last": Navigation link for paginated order lists.

4.5.6.3 Example

Request

GET https://api.testbank.com/v2/securities-accounts/3dc3d5b3-7023-4848-9853-f5400a64e81g/orders?dateFrom=2022-03-01

Accept: application/json
X-Request-ID: 99391c0e-ad88-49ec-a2ad-99ddcb1f7756
Consent-ID: 8bd44685-026d-4484-8cc2-243d4f0b04ff
PSU-User-Agent: Mozilla/5.0 (Windows NT 10.0; WOW64; rv:54.0)
Gecko/20100101 Firefox/54.0
Date: Fri, 25 Mar 2022 15:05:37 GMT

Response

HTTP/1.x 200 Ok
X-Request-ID: 99391c0e-ad88-49ec-a2ad-99ddcb1f7756
Content-Type: application/json
Date: Fri, 25 Mar 2022 15:05:38 GMT

```
{
  "account": {"iban": "DE2310010010123456788"},

```

```
"orders": [  
  {  
    "orderId": "aeec95a2-d227-4583-8c73-000f8e867997",  
    "side": "buy",  
    "financialInstrument": {  
      "isin": "DE000BASF111",  
      "name": "BASF SE Namens-Aktien o.N."  
    },  
    "unitsNumber": 100,  
    "orderStatus": "filed",  
    "_links": {  
      "orderDetails": {  
        "href": "https://api.testbank.com/v2/securities-  
accounts/3dc3d5b3-7023-4848-9853-f5400a64e81g/orders/aeec95a2-d227-4583-  
8c73-000f8e867997"  
      },  
      "relatedTransactions": [  
        {  
          "href": "https://api.testbank.com/v2/securities-  
accounts/3dc3d5b3-7023-4848-9853-f5400a64e81g/transactions/d8c2dfcf-3187-  
4e67-b5cd-b1953923a0b9"  
        }  
      ]  
    }  
  }, {  
    "orderId": "23a1a8b1-8d4c-4955-a448-5976ef4a875c",  
    "side": "buy",  
    "financialInstrument": {  
      "isin": "DE0007480204",  
      "name": "Deutsche EuroShop AG Namens-Aktien o.N."  
    },  
    "unitsNumber": 200,  
    "orderStatus": "acceptedForBidding",  
    "_links": {  
      "orderDetails": {  
        "href": "https://api.testbank.com/v2/securities-  
accounts/3dc3d5b3-7023-4848-9853-f5400a64e81g/orders/23a1a8b1-8d4c-4955-  
a448-5976ef4a875c"  
      }  
    }  
  }  
]
```



4.5.7 Read Securities Order Details

4.5.7.1 Request

Call

GET /v2/securities-accounts/{account-id}/orders/{order-id}

Reads order details from a given order addressed by "orderId" on a given securities account addressed by "securities-account-id".

Path Parameters

Attribute	Type	Description
account-id	Max70Text	This identification is denoting the addressed securities account. The securities-account-id is retrieved by using a "Read Securities Account List" call. The securities-account-id is the "resourceId" attribute of the account structure. Its value is constant at least throughout the lifecycle of a given consent.
order-id	Max70Text	This identification is given by the attribute "orderId" of the corresponding entry of a securities order list.

Query Parameters

No query parameters defined.

Request Header

The same requirements towards request headers apply as for the "Read Account List" request (see section 4.5.1).

Request Body

No request body.

4.5.7.2 Response

Response Code

HTTP Response Code equals 200.

Response Header

Attribute	Type	Condition	Description
X-Request-ID	UUID	Mandatory	ID of the request, unique to the call, as determined by the initiating party.

Response Body

A JSON response is defined as follows:

Attribute	Type	Condition	Description
orderDetails	Securities Order	Mandatory	Details of the requested securities order.

4.5.7.3 Example

Request

GET https://api.testbank.com/v2/securities-accounts/3dc3d5b3-7023-4848-9853-f5400a64e81g/orders/23a1a8b1-8d4c-4955-a448-5976ef4a875c

Accept: application/json
 X-Request-ID: 94a91c7e-ad88-49ec-a2ad-99ddcb1f7756
 Consent-ID: 8bd44685-026d-4484-8cc2-243d4f0b04ff
 Date: Fri, 25 Mar 2022 15:05:37 GMT
 API-Contract-ID: 3bd7ccec-6510-4907-909d-2fbc0fc5f0f0

Response

HTTP/1.x 200 Ok
 X-Request-ID: 94a91c7e-ad88-49ec-a2ad-99ddcb1f7756
 Content-Type: application/json
 Date: Fri, 25 Mar 2022 15:05:38 GMT

```
{
  "orderId": "23a1a8b1-8d4c-4955-a448-5976ef4a875c",
  "side": "buy",
  "financialInstrument": {
    "isin": "DE0007480204",
    "name": "Deutsche EuroShop AG Namens-Aktien o.N."
  },
  "unitsNumber": 200,
  "placeOfTrade": {"mic": "XETR"},
  "limitPriceAmount": {"currency": "EUR", "amount": "36.50"},
  "typesOfOrder": [ "limitOrder", "allOrNone" ],
  "timeInForce": "goodForMonth",
  "expiryDateTime": "2022-03-31T23:59:59.999+1:00",
  "relatedCashAccount": {"iban": "DE40100100103307118608"},
  "orderModifyable": true,
  "orderStatus": "acceptedForBidding"
}
```

5 References

5.1 Informative References

- [oFA-GuideV2] openFinance API Framework, A Guide to Version 2 05 October 2023
- [oFA-ComV2] openFinance API Framework, XS2A API as PSD2 Interface, Implementation Guidelines, Version 2.0 05 October 2023
- [PSD2] Directive (EU) 2015/2366 of the European Parliament and of the Council on payment services in the internal market, published 23 December 2015
- [oFA-OR-Com] openFinance API Framework, Compliance Services, Operational Rules, to be published yet

5.2 Normative References

- [oFA-ProtSec] openFinance API Framework, Protocol Functions and Security Measures in Version 2.x, version 2.0, 05 October 2023
- [oFA DaD] openFinance API Framework, Data Dictionary for V2.x, Version 2.1, 08 February 2024
- [oFA-CO] openFinance API Framework, Consent API for V2, Implementation Guidelines, Version 2.0, 05 October 2023
- [oFA-IG-ADM] openFinance API Framework, Implementation Guidelines for Administrative Services, Version 1.0, 21 February 2024



Annex A Best Practices for Converting Codes from ISO 15022 Messages

Currently, a widely used format for displaying security related information is ISO15022, particularly:

- MT502 to display orders
- MT535 to display holdings
- MT536 to display securities transactions

Annex A.1. Mapping of Securities Balance Codes

Most of the values of the Qualifier of an MT535 messages field 93a (compare <https://www.iso20022.org/15022/uhb/mt535-43-field-93a.htm>) are also valid values of the **Securities Balance Type Code** (see [oFA DaD]). They can therefore be transferred to element balanceType without any conversion. Only for the following values, a conversion is necessary:

Code MT535	Description	SecuritiesBalanceTypeCode
AGGR	Aggregate	Not used, the security balance code is only used for individual positions in the context of the document at hand.
NAVL	Not Available Balance	BLOK

Annex A.2. Mapping Of Transaction Activity Code

The values of **Transaction Activity Code** (see [oFA DaD]) are identical to the values of the transaction indicator of MT536: (38) Field 22a: Indicator (<https://www.iso20022.org/15022/uhb/mt536-38-field-22a.htm>). They can therefore be transferred without further conversion.

Annex A.3. Mapping of Market Type Code

The values of **Market Type Code** (see [oFA DaD]) are identical to the values of the source of price code used in MT536: (25) Field 94B: Place: Source of Price (<https://www.iso20022.org/15022/uhb/mt536-25-field-94b.htm>) and in MT535: (39) Field 94B (<https://www.iso20022.org/15022/uhb/mt535-39-field-94b.htm>). They can therefore be transferred without further conversion. For Security Orders (MT502) no corresponding information exists. The missing information in orders is no blocker for serving the interface, as the sourceOfPrice is only used as an optional element within this framework.

Annex A.4. Mapping of Type of Price Code

The values of **Type of Price Code** (see [oFA DaD]) cover the values of the qualifier in field "price" (90a) of MT535 (see <https://www.iso20022.org/15022/uhb/mt535-46-field-90a.htm>)

and MT536 (see <https://www.iso20022.org/15022/uhb/mt536-24-field-90a.htm>) messages. They can therefore be transferred without further conversion. For Security Orders (MT502) no corresponding information exists. The missing information in orders is no blocker for serving the interface, as the priceType is only used as an optional within this framework.

Annex A.5. Mapping of External Financial Instrument Identification Type Code

No specific fields are defined in MT messages to represent financial instrument identification other than ISIN. The field shall be filled according to the local conditions of usage.

Annex A.6. Mapping of Trading Session Type Code

Trading Session Type Code (see [oFA DaD]) can be derived from the **Trading Session Indicator** of an MT502 message (see <https://www.iso20022.org/15022/uhb/mt502-18-field-22a.htm>). The mapping can be done in a straightforward fashion as shown in the following table:

Code MT502	Description	Trading Session Type Code
AUCT	Auctions	auctions
CONT	Continuous	continuous

Annex A.7. Mapping of Securities Order Side

Securities Order Side (see [oFA DaD]) can, on principle, be derived from the Buy/Sell Indicator of an MT502 message (see <https://www.iso20022.org/15022/uhb/mt502-18-field-22a.htm>). However, currently not all of the MT502 indicators are reflected in the **Securities Order Side** code list.

Informative: List of MT502 Buy/Sell Indicator values:

Code MT502	Description	Securities Order Side
BUYI	Buy	buy
CROF	Cross From	[not supported]
CROT	Cross To	[not supported]
DIVR	Reinvestment of Dividend Order	[not supported]
FPOO	FPO Order	[not supported]

Code MT502	Description	Securities Order Side
IPOO	IPO Order	[not supported]
IPPO	IPP Order	[not supported]
REDM	Redemption	redemption
SELL	Sell	sell
SUBS	Subscription	subscription
SWIF	Switch From	[not supported]
SWIT	Switch To	[not supported]

Annex A.8. Mapping of Type of Order Code

Type of Order Code (see [oFA DaD]) can be derived from the **Type of Order Indicator** of an MT502 message (see <https://www.iso20022.org/15022/uhb/mt502-18-field-22a.htm>). The mapping can be done in a straightforward fashion as shown in the following table:

Code MT502	Description	Type of Order Code
ALNO	All or None	allOrNone
BCSE	Buy Contra Short Exempt	buyContraShortExempt
BCSH	Buy Contra Short	buyContraShort
BMIN	Buy Minus	buyMinus:
CARE	Carefully	carefully
COMB	Combination Order	combinationOrder
DISC	Discretionary	discretionary
DNIN	Do Not Increase	doNotIncrease
DNRE	Do Not Reduce	doNotReduce
ICEB	Iceberg Order	icebergOrder
LIWI	Limit With	limitWith
LIWO	Limit Without	limitWithout
LMTO	Limit Order	limitOrder

Code MT502	Description	Type of Order Code
MAKT	At Market	atMarket
MANH	Market Not Held	marketNotHeld
MTLO	Market to Limit Order	marketToLimitOrder
MUTO	Market Until Touched	marketUntilTouched
NOHE	Not Held	notHeld
ORLI	Order Lie	orderLie
SLOS	Stop Loss	stopLoss
SPLU	Sell Plus	sellPlus
STLI	Stop Limit	stopLimit
STOP	Stop Order	stopOrder
SSEX	Sell Short Exempt	sellShortExempt
SSHO	Sell Short	sellShort

Annex A.9. Mapping of Order Time Limit Code

Order Time Limit Code (see [oFA DaD]) can be derived from the **Time Limit Indicator** of an MT502 message (see <https://www.iso20022.org/15022/uhb/mt502-18-field-22a.htm>). The mapping can be done in a straightforward fashion as shown in the following table:

Code MT502	Description	Order Time Limit Code
CLOS	At the Closing	atTheClose,
FAKI	Fill and Kill	fillAndKill
FIKI	Fill or Kill	fillOrKill,
GDAY	Good for the Day	day
GTCA	Good until Cancelled	goodTillCancel
GTHD	Good through Date	goodTillDate
GTMO	Good for the Month	goodForMonth

Code MT502	Description	Order Time Limit Code
GTNM	Good until the End of Next Month	goodTillDate (+ specification of the end of next month in expiryDateTime)
GTXO	Good till Crossed	goodTillCrossing,
IOCA	Immediate or Cancel	immediateOrCancel,
OPEN	At the Opening	atTheOpening,
-	-	goodThroughCrossing,
-	-	atCrossing
-	-	goodForTime
-	-	goodForAuction,

Annex A.10. Mapping of Order Status Code

As the order Status is not part of an MT502 message, no mapping can be provided.