

User Guide

Application Programming Interface for FX Transactions

EFFECTIVE MARCH 2022

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Investor &
Treasury Services

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Contents

FX Transaction Web API	3
Introduction	3
RESTful Web Services	3
Deployment Environments	3
API Authentication & Authorization	4
Authorization Endpoint	4
API Endpoints	5
Transactions	5
API Response Codes & Statuses	8
HTTP Response Status Codes	8
Samples of API Requests	9
Client Requests	9
Authorization Endpoint	9
Transactions	9
How to use our APIs?	10
Instructions	10

FX Transaction Web API

Introduction

This is a manual of web service Application Programming Interface (API) for RBC Investor & Treasury Services (I&TS), FX Transactions. The readers of this document are expected to be application developers with basic knowledge of APIs and web services. The FX Transaction Web API will be used by the clients to get foreign exchange details from our transaction execution application whenever they require.

APIs are mechanisms through which value is exchanged between counterparties. They serve as powerful building blocks around most applications creating new customer experiences. RBC I&TS' aim of FX Transaction Web API is to enable clients' to access everyday foreign exchange transactions for their accounts. This mandate includes spot, forward and swap foreign exchange transactions.

All calls to our APIs are validated and authorized in a secure manner. Returned data sets are based on the level of access clients have and information they require. Foreign exchange data sets are available daily based on trade date.

RESTful Web Services

Our APIs are designed as web services with Representational State Transfer (REST) architectural style. Web services are exposed to client applications via communication channels called endpoints that are represented with external Uniform Resource Locators (URLs) of particular services. Each endpoint (one end of the communication channel) uses a Hypertext Transfer Protocol (HTTP) request method allowing them to receive the particular data. So, clients can decide to call a specific service to get the data they require. This makes our APIs into building blocks that can seamlessly integrate with clients' backend systems, application infrastructures, or data warehouses.

- clients can **use a programming language of their choice to call APIs** and receive data
- API **response payloads are in JSON** (JavaScript Object Notation) format by default
- APIs validate each user call against the user profile and appropriate access to data
- APIs use the industry-standard OAuth (Open Authorization) protocol for authorization
- we maintain an audit trail table for every API call for audit purposes (logging user details, date & time, or request & response payloads)

Deployment Environments

The FX transaction Web API is deployed and executed in particular environments to manage their governance and API lifecycle. The production environment (PROD) is for live API products (listed in the table below).

ENVIRONMENT	AUTH BASE URL	API BASE URL
PROD	https://ssoa.rbc.com/as	https://api-rbccone.rbcits.com/secure/rbccone

API Authentication & Authorization

Authorization Endpoint

Descriptor: *request the access token for authorizing API calls.*

This is a separate API endpoint to authorize clients' API calls and access data. It authenticates clients and then issues their access token. This token is used in the API request payload of any API calls to our endpoints.

- the access token has its issue time and expire time for the client app security purposes
- clients have to **provide their user credentials to get their access token**
- clients have to **get a new access token once their token expires**
- clients have to **use specific user credentials & AUTH BASE URL pertaining to deployment environment of API endpoints** they would like to get authorized for (make successful API calls)

API Request

HTTP Method	URL
POST	{AUTH_BASE_URL}/token.oauth2

headers	value
Content-Type	application/x-www-form-urlencoded

body	value	description	required field
client_id	{YOUR_ID}	public identifier for applications (string that should not be guessable)	mandatory
client_secret	{YOUR_SECRET}	secret known only to the application and the authorization server (string that should not be guessable)	mandatory
grant_type	client_credentials	type of grant mechanism to receive client tokens (access or refresh tokens)	mandatory

API Response

body	data type	description
access_token	string	access token issued by authorization server
token_type	string	type of access token
expires_in	integer	duration of time the access token is granted for

API Endpoints

Transactions

Descriptor: *get the FX transactions data based on trade date.*

This web method will return a list of all FX Standing Instructions for the client which have been made within the past 1 year. If no date is selected in the optional date parameters, it will default to the previous day. It returns data that has been audited and reconciled.

API Request

HTTP Method	URL
GET	{PROD_API_BASE_URL} /tms-fx/v1/transactions
headers	value
Authorization	Bearer {YOUR_ACCESS_TOKEN}

API Request Parameters

body	Required field	data type	description
startDate	optional	date	Range Start Date for transaction trade date, "format: yyyy-mm-dd". If no value provided, default is today's date
endDate	optional	date	Range End Date for transaction trade date, "format: yyyy-mm-dd". If no value provided, default is today's date
clientAccountNumber	optional	array	A comma separated list of Client Account Numbers (including any prefixed zeros). If none is provided, the default returns all permitted transactions.
CurrencyType	optional	string	The currency type of the transaction; either 'MATURE' or 'RESTRICTED'
product	optional	string	The FX Product related to the transaction; either 'MANDATE' or 'COS'
size	optional	integer	Number of Records returned per page. Default 1000. Default sorting for paging purpose is tradeDate, descending. Default value : 1000

page	optional	integer	Page number. Default sorting for paging purpose is tradeDate, descending. Default value : 0
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API Response

body	data type	description
clientName	string	Client name
fundManagerName	string	Investment Manager responsible for managing the account
accountCode	string	Client account number
accountName	string	The name of the account
deskType	string	Executing desk for the transaction
transactionDirection	string	Type of transaction (buy/sell)
fxiNumber	number	FXI Number
fxType	string	Foreign Exchange Agreement Type
tradeCurrency	string	Currency in which a trade is executed from the perspective of RBC and its clients
tradeAmount	number	Trade amount
baseCurrency	string	Base currency of the transaction
baseAmount	number	Base amount
spotRate	number	Spot rate of the transaction
clientRate	number	Client rate of the transaction
marketRate	number	Market rate of the transaction
legType	string	Leg type
tradeDate	date	Date that the parties to a trade (sale or purchase) agree to execute the trade (yyyy-MM-dd)

valueDate	date	Value Date (yyyy-MM-dd)
CurrencyType	string	The business segment of the transaction
feesBaseCurrency	number	Fees in base currency
pctFees	number	Fees percentage
pctMargin	number	Margin percentage
currencyPair	string	Currency pair based in direct method
priceDate	string	Date priced
executionDatetime	string	Time trade was executed
locationName	string	Location of trading desk
product	string	FX Product related to the transaction
brokerCode	string	Broker Short Name
reversalIndicator	string	Reversal Indicator
executionHour	number	Time of execution
marketPoints	number	Market Points
FeesEur	number	Fees in EUR currency
spotFeesEur	number	Spot FX fees in EUR currency
forwardFeesEur	number	Forward FX fees in EUR currency
tradeAmountEur	number	Trade amount in EUR
statusIndicator	string	Status Indicator

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API Response Codes & Statuses

HTTP Response Status Codes

The FX transaction Web APIs use the standard HTTP status codes, that server issues in response to client requests. They are separated into five classes. The first of three digits defines the class of response. Digit 1 denotes **informational** class, 2 for **successful**, 3 for **redirection**, 4 for **client error**, and 5 for **server error** class. The below table highlights the particular status codes.

code	status
200	OK
400	Bad Request
401	Unauthorized
403	Forbidden
404	Not Found
500	Internal Server Error

Samples of API Requests

Client Requests

Clients can create network requests to our API endpoints with the below client URL (cURL) syntax. The cURL is a Command-Line Interface (CLI) tool for transferring data, which are specified with URL syntax. It is an easy way to test APIs straight from the CLI.

Authorization Endpoint

```
curl -X POST \  
{AUTH_BASE_URL}/token.oauth2 \  
-H 'Content-Type: application/x-www-form-urlencoded' \  
-d 'client_id={YOUR_ID}&client_secret={YOUR_SECRET}&grant_type=client_credentials'
```

Transactions

```
curl -X GET \  
"{PROD_API_BASE_URL}"/tms-fx/v1/transactions" \  
-H 'Authorization: Bearer {ACCESS_TOKEN}'
```

How to use our APIs?

Instructions

Below are user instructions described in few steps. It allows clients to first try to consume our APIs in PROD deployment environment, before they integrate APIs with their backend systems. The required test files and user credentials are supplied separately to clients.

1. Download & install the Postman tool (a friendly GUI to consume APIs).

- Postman can be downloaded from <https://www.getpostman.com/downloads/>

2. Import our Postman collection & environment.

- a. click on “Import” (top left top corner) in Postman
- b. drag and drop the following test files
 - “FX.postman_collection.json”
 - “FX.postman_environment.json”

3. Select the imported environment to load the variables for APIs.

- a. click on the dropdown in the top right showing “No Environment”
- b. select the “RBC FX transaction API” environment

4. Get your access token to call our APIs.

- a. click on the “Collections” tab on the left toolbar
- b. expand the “RBC FX transaction API” folder
- c. click on “POST authorization”
- d. click on “Send” button (blue button on the upper right side)

5. Execute the APIs.

- a. click on the “Collections” tab on the left toolbar
- b. expand the “RBC FX transaction API” folder
- c. execute the following API
 - GET FX All transactions