

# Eikon Python API Wrapper

Feel free to fork this repo if you want to play around with the code. Also, please don't hesitate to open pull requests to the repo if you have improved the code.

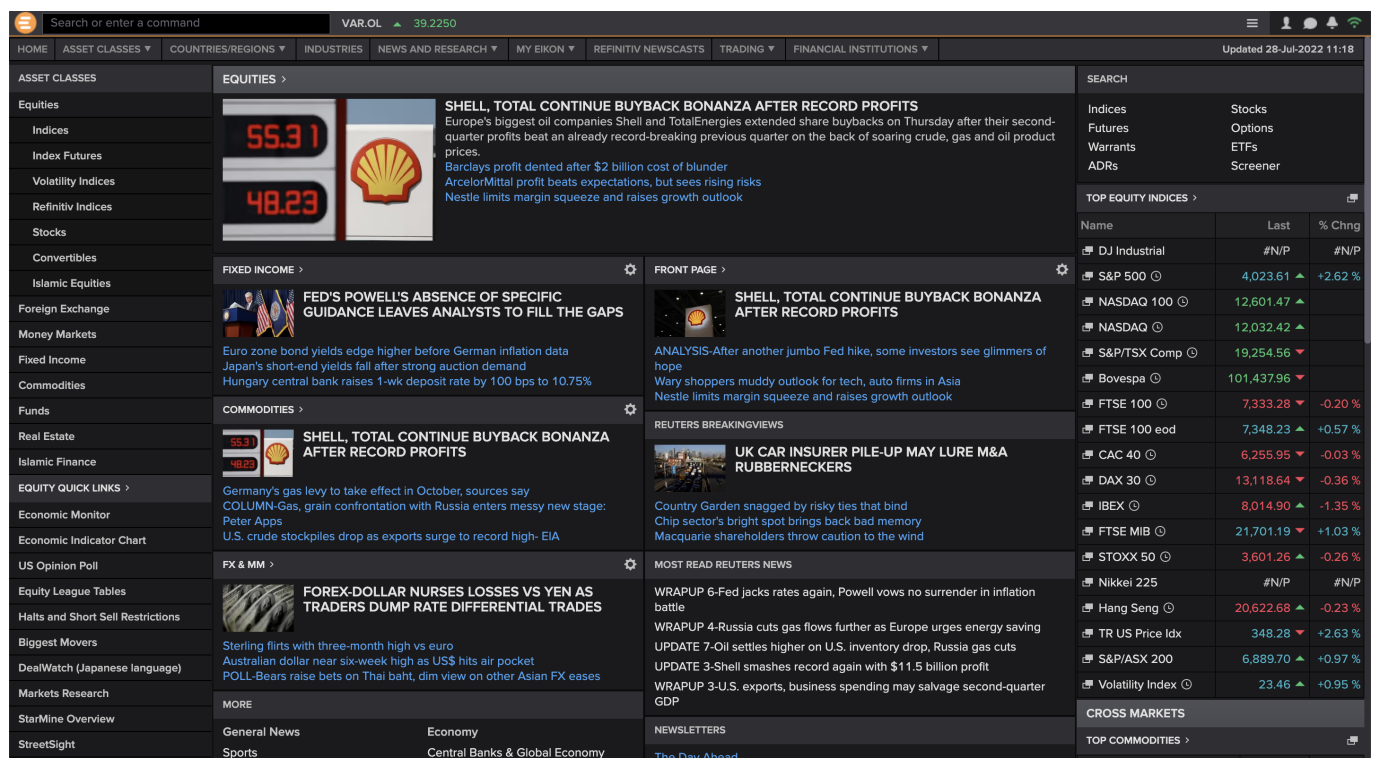
## Project Overview

Welcome to the future of writing a quantitative Project and Master's thesis at the Institute for Industrial Economy (or whatever else you want to use these tools for, feel free). Two former Indøk students created this repository. During the work on our Master's thesis ([Ankile & Krange, 2022](#)), we created the precursor to the code to make collecting large amounts of financial data as easy as possible. In this repo, we have tried to provide a generalized system that allows easy access to the most-used financial data (stocks, bonds, commodities), examples, and documentation. In short, this project we wished existed when we embarked on our Master's journey on a dark and cold March night in 2022.

This project assumes some basic knowledge of Eikon. For an in-depth guide to using Eikon together with the Excel plugin to extract bond data, see [Fosse \(2021\)](#). That guide goes into deep detail on using the Excel plugin and could be wise to peruse when working with Eikon.

## Introduction to Eikon

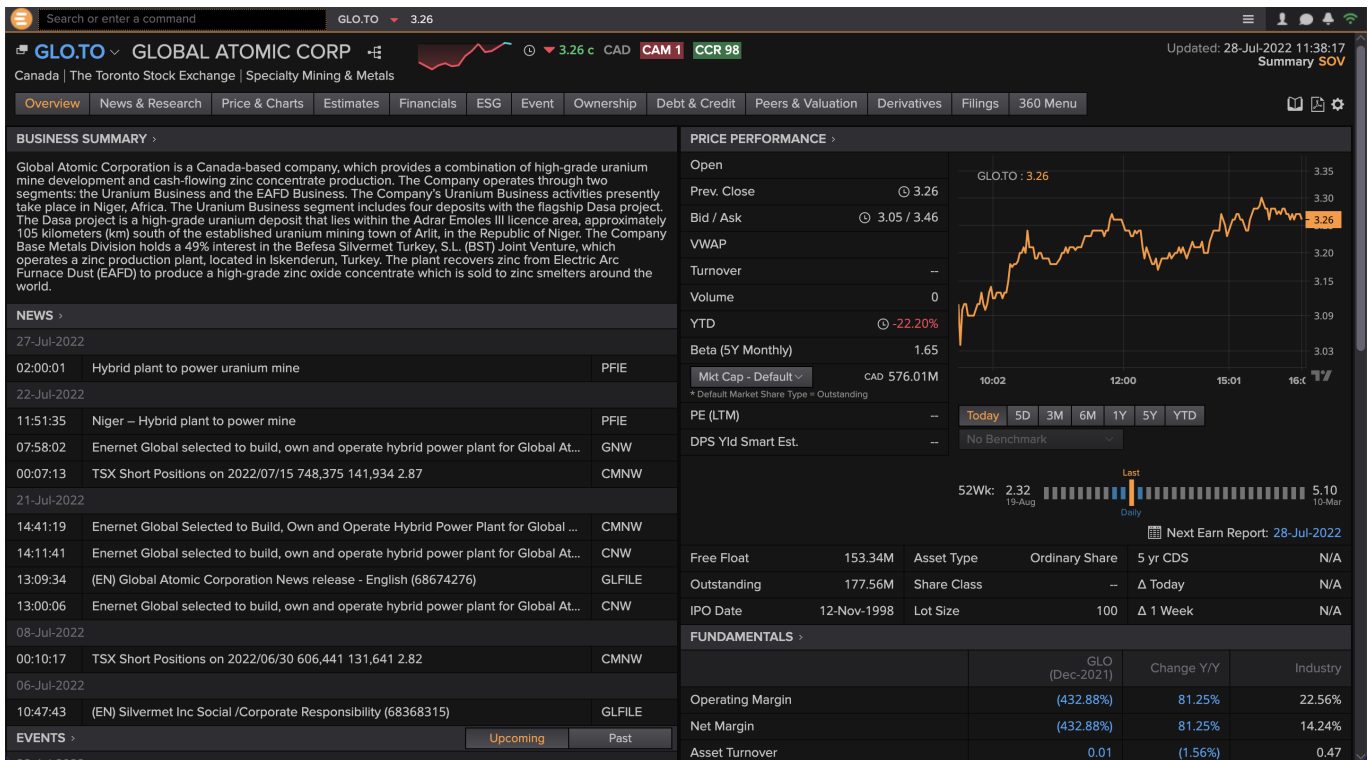
Refinitiv Eikon (Eikon) is a solution for financial professionals to provide a wide array of financial information for several asset classes and geographies. Detailed and up-to-date information on equities (stocks), bonds, commodities, forex, and other macro-financial variables is available. For comparison, Eikon is similar to the well-renowned Bloomberg Terminal and serves the same purpose, only to a slightly lesser extent. However, the current project seeks to bridge the gap somewhat.



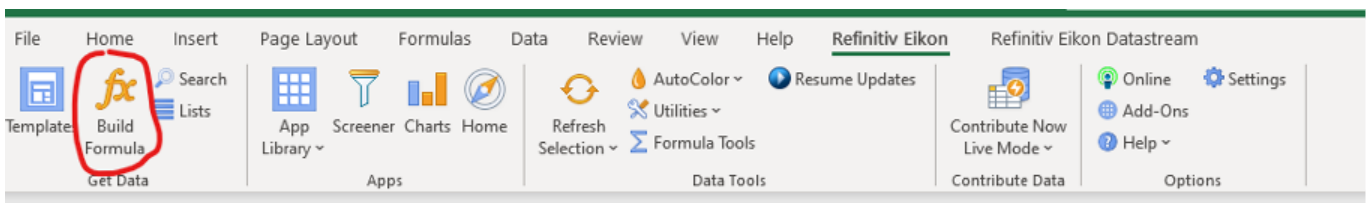
You can access the data through several avenues, e.g., an iPhone application, a Windows desktop application, a web interface, and an Excel plugin. However, the central research hub usually centers around the Windows application, often termed the "Terminal." Here, one can explore the data the system provides in a visual interface. Our main access point at Indøk (as of writing this guide in July 2022) is on a specific stationary computer found in the southwest corner of the computer room on the third floor of Kjelhuset. In addition, there are several more terminals situated at the Handelshøyskolen.

For example, one can search for specific companies in the search bar at the top-left and explore all available information for that company, like historical prices, multiples, peers, fundamentals, and news. One can also use a screening tool to find a list of companies fulfilling an arbitrary list of criteria. For example, one can automatically find all stocks within a specific revenue range in a particular sector. Then, one can extract any information available for that list of companies.

		global	GLO.TO ▼ 3.45	
EQ		<b>Global Atomic Corp</b> Ordinary Share - The Toronto Stock Exchange - GLO	GLO.TO	5 c CAD 0.09
Can		→ Overview	GLO.TO OV	
OV		→ Quote	GLO.TO Q	Ownership Det
		→ Financial Chart	GLO.TO CHTF	
BUS		→ Fund Shareholders Peers Analysis	GLO.TO FNPEERS	
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INDX		Refinitiv <b>Global</b> Price Return Index Equity Index	.TRXFLDGLPU	ade uranium h two ities presently p Dasa project. , approximately r. The Company which tric Arc rs around the
APP		Flows Explorer ( <b>Global</b> Iron OreTrade Flows) Global Iron OreTrade Flows	IOFL	
EQ		<b>Global Education Ltd</b> Ordinary Share - National Stock Exchange of India - GLOBAL	GLOL.NS	
FND		Invesco QQQ Trust Series 1 Equity ETF - US46090E1038 - USD - NASDAQ Global Market Consolidat...	QQQ.O	
ECON		United States, PMI, Manufacturing Sector, Total, Final Economic Indicator - S&P Global	USMPMF=ECI	PRN
FX		<b>Global</b> currencies FX Spot and Cross Rate REFINITIV	FX=	
COM		<b>GLOBAL COFFEE COMPOSITE PAGE</b> Coffee - Commodity Forward - Source is a Refinitiv Contributor	COFWLD	PFIE
IRD		Israeli Shekel/US Dollar 3 Month TELBOR/SOFR Currency Ba... GLOBAL BOX	ILUS3TSRBS=GBTA	PFIE
		More search results for "global "	Shift+Enter	GNW
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For example, one can navigate to the company's chart page and export the data to get stock data on a specific company. However, this method is very tedious when one wants data for several companies. The most common solution to this issue is to use the Excel plugin. This plugin allows one to define the tickers and fields one wants and copy-paste formulas in a range to get data for all tickers and all required data items. For example, one can have a list of company tickers in one column and a list of data points one wants for those companies (revenue, EBIT, etc.) in a row. Then, with the help of the formula-builder, one can create a formula that references the tickers and data item names in the rows and columns and gets that data.

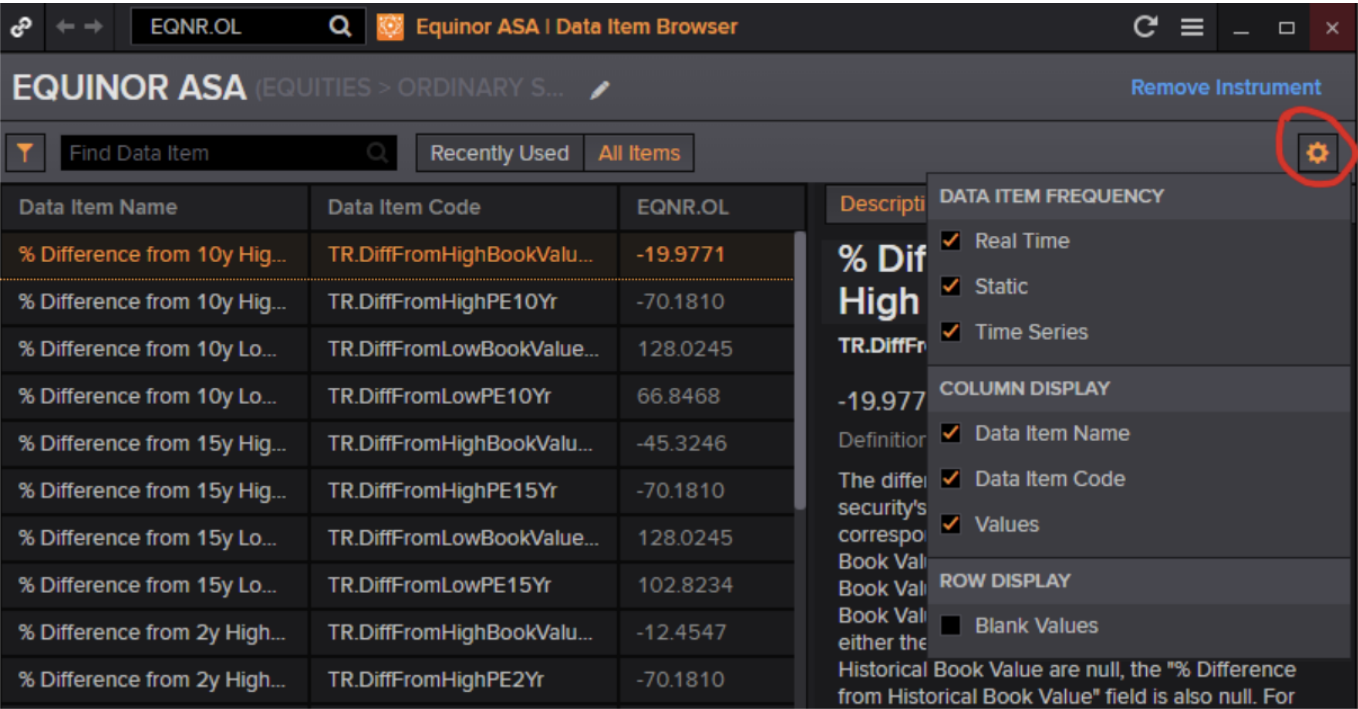


## The Eikon Data Item Browser

The most important part of the Eikon data platform to work with in conjunction with the API is the Data Item Browser. We adapted the following from Fosse (2021):

The Data item browser is a tool to browse data items (Eikon uses the term data item for a type of information regarding an instrument). To find the Data Item Browser, search for it in the top left search field. When entering a ticker, you can see all available data items. This feature helps explore the data available for that instrument and how Eikon represents the data. Then use the Formula Builder to extract that data item using its Data Item Code.

**Tip:** To find what you are searching for more efficiently, use the options in the right corner. Displaying blank values can be helpful as they may not be empty for other relevant instruments. At the bottom, you can sort for relevance and A-Z. In my experience, Eikon may not share your perception of relevance so that A-Z can be useful.



Getting the Python API up and running

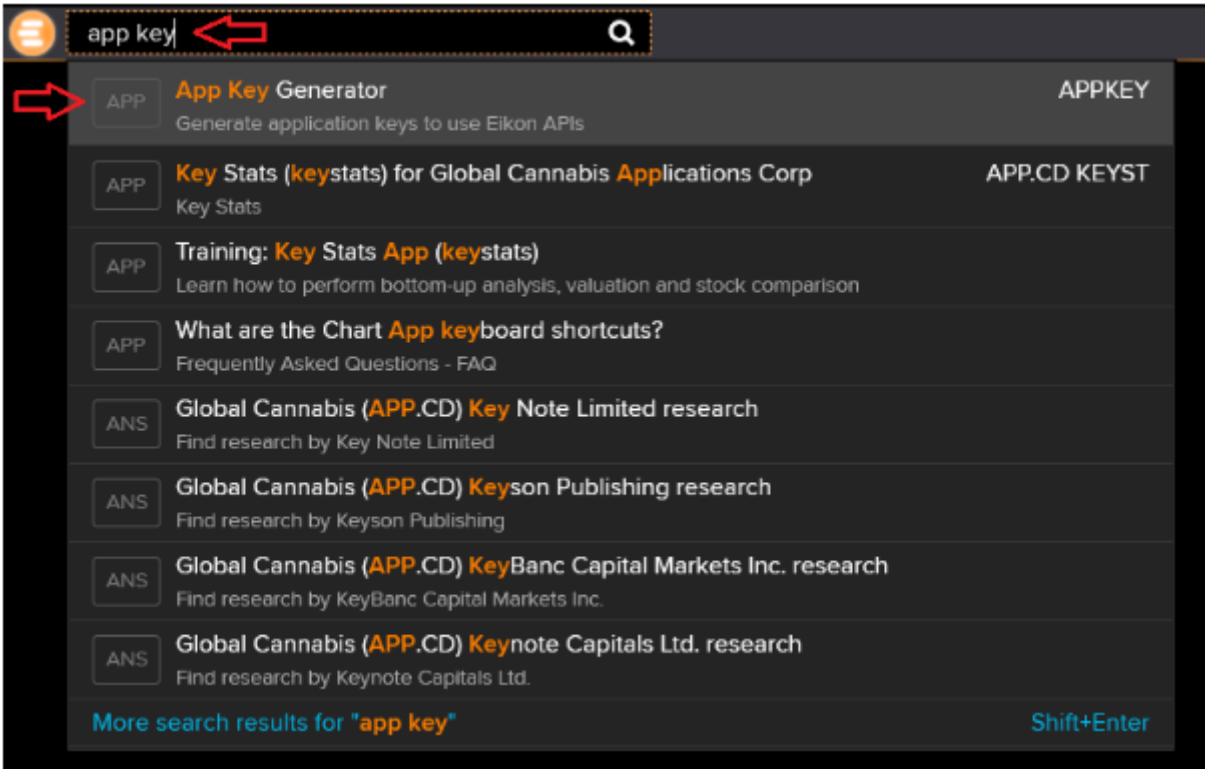
We have condensed and adapted this section from the [official documentation](#).

1. Start the Eikon desktop program on the accessing computer.

On the computer at "Finanssal" at Kjelhuset, the easiest is probably to press the windows key and search for Eikon.

2. Create an app key for your application

- 1. Search for "app key" in the Eikon search bar and navigate to the "App Key Generator" page.



2. Once there, create your key by filling out the info at the top of the page. Please give it a suitable name (preferably something identifying you and when you're writing your thesis. This way, administrators can safely delete your key once you're long gone (into consulting or banking to do the devil's bidding)) and check "Eikon Data API" as the API access. Finally, click the "Register New App" button to create your key.

4. Accept the terms and conditions (Important! Read all the terms and conditions before accepting!)
5. Your app key should appear. Go ahead and copy that for later.

App Name	ProductID	App Key
My new application	THEWOCKHEADS COMPANY.MYNEWAPPLICATION	8e5a3ec17ebc4177ce51a69045176056221b031c

### 3. Install the Eikon package and register with the app key

We assume you've leveraged your vast Python experience from TDT4110 — Information Technology, Introduction to set up the standard Python environment. The easiest way to get started in the present context is with [Anaconda](#) since this distribution already has Pandas and Numpy installed.

1. Install the `eikon` package by running the command `pip install eikon`.
2. Ensure you import the `eikon` package with the command `import eikon as ek`.
3. Register the code with Eikon with the command  
`ek.set_app_key('420a3xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx216969c')`.

You are ready to use the Eikon Python API (or our extension).

## Why should we use the Eikon API?

Some basic information on the official Eikon Python package we base this project on can be found [here](#). More in-depth documentation of the API is in [this pdf](#).



One important reason for using the API instead of the Excel plugin is because of some critical limitations of Excel/Eikon:

- Eikon only allows fetching of data for 500 tickers (companies, bonds, commodities, etc.) at a time—getting more means creating several Excel sheets and merging them manually.
- Excel only accommodates a little over one million rows and 16 000 columns—very little in our modern big-data age—and if more is required, tough luck solving it with Excel.
- Excel is slow and inflexible when handling and manipulating data and fetching data from Eikon's servers, especially when the number of rows grows.
- Excel is not particularly well suited for getting and working with time-series data.
- Requesting data with Excel requires manual manipulation of the rows, columns, and formulas to get data—Python is much more flexible and automatable.

## But Eikon already has a Python API. So why does this project exist?

Eikon has a python package that allows one to get data with Python. However, they have not made it easy for people to use—instead, the opposite—at times, it seems like they have tried to make users' lives as hard as possible. Still, the gang over at Refinitiv claims this about their Python API wrapper:

The Eikon Data API Python library is an ease-of-use library that conveniently wraps the raw message transcription between Eikon and Python and provides user-friendly data retrieval calls. The data output from the Eikon Data API Python library is available as Pandas DataFrames or as JSON objects.

I'm afraid that's not right. There is no ease of use, and the package feels outright hostile to users.

This project, then, generalizes much of the code we painstakingly arrived at through countless hours of debugging Eikon errors. You can, of course, ask, "What's the point if it's so hard?" We agree, but if you want large amounts of up-to-date financial data, there is no other source available to us than Eikon (as far as we know), and Excel does just not cut it.

## Some issues to be aware of in the vanilla Eikon API

- There are two main methods to get time-series data: `get_data` and `get_timeseries`. When one shall use each function is not intuitive.
- Eikon tends to time out or throw errors when requesting much data. Such timeouts often occur because one asks for too much data. Too much could entail requesting too many items or sending too many requests per day. Eikon does not tell which it is when throwing a timeout error.
- When using `ek.get_timeseries`, the available fields vary with what type of data you request. For example, when requesting stock quotes, "CLOSE" and "OPEN" are available, while "VALUE" is not. When getting macro series, the "VALUE" field is populated while all the others are not.

## How we addressed the issues

We have tried to address the main pain points we experienced in the making our Master's. Our solution involves code that simplifies the dichotomy between the two data functions, handles batching and waiting when getting large amounts of data overnight, and manages common errors.

## Other Eikon

- **Finding fields:** Select a small set of tickers and all data items that might interest you. Then, run `get_data` without specifying a filename and inspect the resulting data frame to see which data items are valid for this kind of entity.

## Overview of Python package

This tool centers around two main entry points:

1. **A screening tool** that helps specify what kinds of securities you want data for and provides you with a list of Eikon tickers satisfying the criteria.
2. **A data download tool** that wraps the standard Eikon API calls in logic that handles splitting requests and delegating to the two underlying data retrieval functions.

### The Screening Tool

The screening tool is mainly a helper to ensure one's screening criteria make sense by showing the user a list of all company names that match the screening criteria. This list we subsequently use in the requests for data, which makes it predictable what tickers one requests data for and how much data to expect.

### Eikon Screening Syntax

Eikon uses a proprietary syntax to define the criteria for which companies to include in the results. It is relatively straightforward to read but less so to write. As an example, if you want data for all public Norwegian oil-related companies (sector code 5010, 5020, 5030) with revenue larger than USD 500 000, you can use the following screening string: `'SCREEN(U(IN(Equity(active,public,primary))), TR.CompanyMarketCap>=500000, IN(TR.ExchangeMarketIdCode,"XOSL"), IN(TR.TRBCBusinessSectorCode,"5010","5020","5030"), CURN=USD)'`.

### Building Eikon Screening Strings

#### Manually with the Data Item Browser

When getting data for our Master's, we resorted to manually writing out the screening string, which works well for simple screens. The best way to do this is to start with an expression that resembles what you need and modify it. Our good old friend, the Data Item Explorer, is great for finding the relevant data item names and values for which one wants to screen.

For example, if one wants to change the above screen to include mining companies with headquarters in Canada and revenue above USD 100 000, one could do the following.

1. Go to the Data Item Browser and insert a company that you know fits your criteria in the "Instrument" box at the top.
2. Then, search for the criteria you want to screen for (business sector and headquarters location in this case).

Search or enter a command

GLO.TO 3.45

Remove Instrument

GLOBAL ATOMIC CORP (EQUITIES > ORDINARY SHARES)

sector code

Recently Used All Items

Data Item Name	Data Item Code	GLO.TO
TRBC Economic Sector Code	TR.TRBCEconSectorCode	51
TRBC Business Sector Code	TR.TRBCBusinessSectorCode	5120
TRBC Industry Code	TR.TRBCIndustryCode	51201050
GICS Sector Code	TR.GICSSectorCode	15
GICS Industry Code	TR.GICSIndustryCode	151040
GICS Sub-Industry Code	TR.GICSSubIndustryCode	15104020
NAICS Sector Code	TR.NAICSSectorCode	21
NAICS International Industry Code	TR.NAICSInternationalIndustryCode	21223
NAICS National Industry Code	TR.NAICSNationalIndustryCode	212231
ICB Industry code	TR.ICBIndustryCode	55
ICB Sector code	TR.ICBSectorCode	551020
TRBC Economic Sector Name	TR.TRBCEconomicSector	Basic Materials
TRBC Business Sector Name	TR.TRBCBusinessSector	Mineral Resources
TRBC Industry Group Name	TR.TRBCIndustryGroup	Metals & Mining
TRBC Industry Name	TR.TRBCIndustry	Specialty Mining & Metals

Description

Parameters

TRBC Business Sector Code

TR.TRBCBusinessSectorCode

5120 (GLO.TO)

Definition:

The Refinitiv Business Classification (TRBC) Business Sector classifies companies that fall under similar business activities. This is the second level in the classification, which represents the business sector of the companies.

Data item search for headquarters

3. In the search result table, the second column gives you the name of the data item to screen with, and the third column shows the appropriate value for that criteria.
4. Lastly, substitute the values found in the Data Item Browser into the screening string, and test it out in the screening function.

For the example in question, the above procedure results in the following screening string:

```
'SCREEN(U(IN(Equity(active,public,primary))), TR.Revenue>=100000,
IN(TR.HeadquartersCountry,"Canada"), IN(TR.TRBCBusinessSectorCode,"5120",),
CURN=USD) '
```

Through the Eikon Equity Screening tool

Examples

Equity

Bonds

Macro

Sources

Ankile, Lars L. & Krange, Kjartan 2022 "Krankile/npmf GitHub repo" <https://github.com/Krankile/npmf>

Fosse, Henrik G. (2021), "The complete guide to extracting bond data from Eikon (as far as I know)." <https://docs.google.com/document/d/1KYKZ6Mcp7nYa3xAMIIHPpvCGj6XhV9Hm/edit?usp=sharing&oid=102135063001800642455&rtpof=true&sd=true>