

# Harmonize Structured TimeSeries

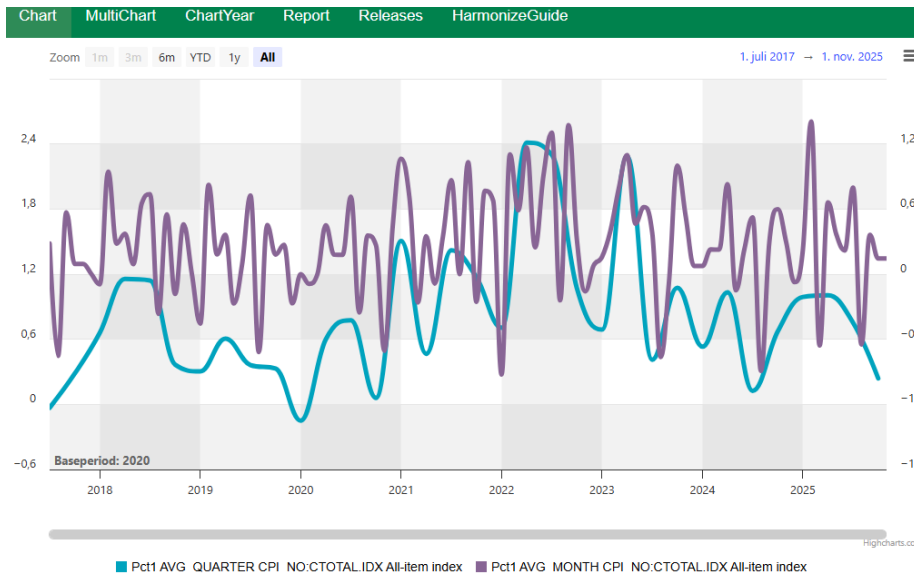
# 2026

## Timeseries tool database & api

March edition. With demo database. Contains export/import samples using Python. (ver 1.9.8.4)

The screenshot shows the HarmonizeTimeSeries application window. On the left is a tree view of categories like Internal, Pices, and External. The main area displays a table of time series data with columns for Name, Desc, LoadSet, Freq, Unit, and Source. Below the table is a configuration grid for each series, including options for Color, Width, Style, Axis, Function, Step, Interval, Aggregate, Type, Stacking, and Order. At the bottom, there are buttons for Chart, MultiChart, and Report, along with a CommonBasisPeriod selector.

ID	Name	Desc	LoadSet	Freq	Unit	Unit	Source1	Updated	Count
101540	CPI_NO:CTOTAL.IDX	All-item index	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102
101549	CPI_NO:CD1.IDX	Food and non-alcoholic beverages	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102
101550	CPI_NO:CD2.IDX	Alcoholic beverages and tobacco	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102
101551	CPI_NO:CD3.IDX	Clothing and footwear	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102
101552	CPI_NO:CD4.IDX	Housing, water, electricity, gas and other...	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102
101553	CPI_NO:CD5.IDX	Furnishings, household equipment and ro...	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102
101554	CPI_NO:CD6.IDX	Health	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102
101555	CPI_NO:CD7.IDX	Transport	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102
101556	CPI_NO:CD8.IDX	Communications	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102
101557	CPI_NO:CD9.IDX	Recreation and culture	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102
101558	CPI_NO:CD10.IDX	Education	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102
101559	CPI_NO:CD11.IDX	Restaurants and hotels	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102
101600	CPI_NO:CD12.IDX	Miscellaneous goods and services	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102
101661	CPI_NO:CD11.1_1_11111.IDX	Rice	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102



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11/01/2026

# Harmonize User and Installation Guide 2026

## Summary

Harmonize is designed to make time series data accessible to users **without programming skills**, while also helping management and analysts save time. The system stores time series in a generic, flexible format, allowing **easy comparison of datasets with different frequencies**. The system is based on MS SQL-Server database. The system also allows users to access the database-procedures (**api**) using tools like **Python** and **R**. By using the Harmonize application, the time series is easily available for many users, having different access, for comparison, with different functions, aggregates and the use of common base year.

Examples:

- Chart a **quarterly index** with a **monthly index** seamlessly.
- Adding a **weekly, monthly, quarterly and annual series** correctly; - Charts can use a **common base year** or **base period**, even if datasets have different base years (e.g., 2015=100 vs 2020=100).

Charts are **zoomable and scrollable** because all data uses datetime formats. You can apply **aggregations** like `avg_quarter` or `avg_year`, and **functions** such as `diff_n`, `pct_1`, `pct_2`, ... `pct_n` (where n is the lag).

Harmonize can be run via the **C# application for windows**, using Highcharts to make modern charts. The Html scripts can be modified to use your colors / fonts and css information, you can also replace higcharts.com with other similar open source javascript charting tools, which are not recommended.

Harmonize can save and retrieve chart selections, for reuse with fresh data later. The dynamic intervals will make sure current year is the current year. However static intervals may be applied if users always want a chart to be with observation in 2025, always.

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# Installation Guide

## Step 1 — Application Installation

**Requirements:** Google Chrome or any modern browser.

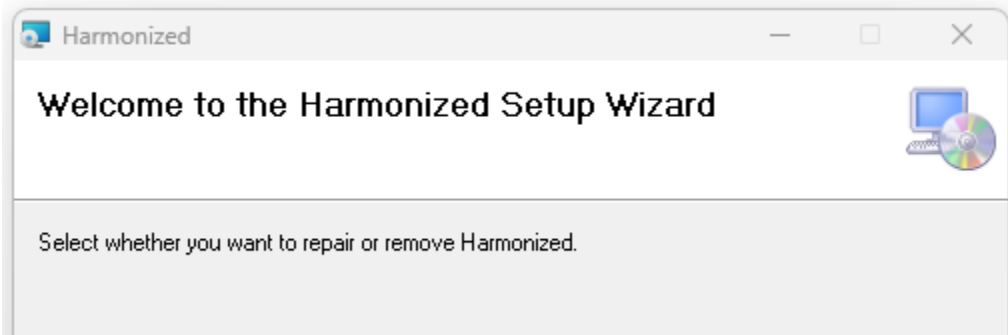
- Download files, unzip the files in a folder C:\Harmonize\app\, and Start

**Harmonize.exe** (with a flag)  Harmonize.exe

**The Harmonize system will initially access a Demo database, with read access to some demo data. When you want to use Harmonize with your own custom data you need your own MSSQL database that only you and your company can access.**

- Alternatively, the more professional alternative, however this required admin rights: Run Setup.exe to copy files to your chosen folder. This requires you to download the Setup..
  - Default location:  
C:\Harmonize\App\
- Main Files installed: (in addition there are some python samples to import & export)

Harmonize.exe	Main application
Harmonize.css	Styling for templates
Harmonize.bak	Database backup, to be restored in your mssql environment.
Chart.html	Single chart template
MultiChart.html	multi-chart template
YearChart.html	Yearly overlay chart template, using current year intervals
Report.html	Report template for direct reporting
Release.html	Release notes
connection.txt	Sample database connection (username/password)
Menues.txt	Menu labels (multi-language support)
ffi.py	generic py script that can import csv files to datasets in the sql
FFItestfile.csv	Sample dummy csv file, to be imported by the <b>ffi.py</b> program
cpi.py	Sample reading CPI from <i>statbank</i> Norway json-stat format
ppi.py	Sample reading ppi-index from <i>statbank</i> in Norway
GetCurvetoPython.py	Gets series from the database and chart it



The application can be installed to a **shared folder** (read access) for multiple users, together with the database connection.txt and the html templates. If usernames and passwords are hardcoded in connection.txt, all files need to be placed at each user personal home drive. The best set up is to use a shared folder, using a trusted database connection.txt not containing any passwords,

During setup, extract files to a temp folder, then run setup.exe. Use default settings, the application will install into C:\Harmonize\App – If later you install Excel Harmonize addin, the XlsAddin will require Harmonize to be installed default to share connection details in connection.txt. This will ensure both applications access the same database if having more databases. The python samples will by default also use same connection.txt details to connect.

Personal data, temporary datafile will be stored by default at C:\Harmonize\Chart, can be changed in connection.txt, but must be a folder that is private for each user.

You may initially try to double click at the file **Releases.html**, and verify it opens in Chrome or Edge. If your html-files is defined to open in ie. *notepad* or any other non-browser application, this needs to be changed, so a browser like Chrome or Edge automatically opens **html** files. When Harmonize application creates charts, they will open in your default browser and read the freshest MyData.js available in your personal C:\Harmonize\Chart folder. To set default browser use Windows+i

When the application is launched, the connection string is shown in the bottom form. In the example above it's used a trusted connection, to user that only has public access to the Harmonize sql database.

By double clicking (selection) one or more series, they will jump to the bottom grid in the application, where you can select interval, function, aggregation, base-year, and chart style. When you have one or more series in the bottom grid, the Chart buttons will be enabled. Inside the charts, you can see the charts as a report, However, you can also report data directly from the application, from Report Menu in the top application bar.

The application lists all datasets accessible to the user. Datasets with **write permissions** are highlighted in **orange**.

For these datasets, a **right-click menu** provides options to:

- Delete a series from the dataset
- Upload data to the selected dataset

To utilize Harmonize, you need a **Microsoft SQL Server database** that you / your company controls with your data series that you populate from internal and external sources.

- Install SQL Server on your machine or server.
  - You may use **SQL Server Express** if a full version is not available.
- Restore the Harmonize database backup ***harmonize.bak*** with the system. Logg in using an administrator like *sa*, use *master*, and restore the database file. You can call the MSSQL -database Harmonize, but other names can be used.
- Verify that you can **connect to the database** using SQL Server Management Studio (SSMS).
  - Ensure that the **user credentials** or **trusted connection** are working.
  - Harmonize is default installed with a trusted connection in *connection.txt*
- Note the database name and connection details; you will need them when configuring ***connection.txt***. See the sample connection details strings in bottom of *connection.txt*. Try to use an integrated / trusted connection, making connection details safer and more secure. The first line only, in the *connection.txt* holds the connection details. Line #2 is the name of the directory where the users temporary data for charting and reporting is stored. Line #3 are the languages in your Menue.txt file that will be selectable in the application. Line# is the default Language, a 0 is the first language: English. Line #5 is the maximum number of rows returned for one series, This is typically only important for time series of high frequency such as hourly, minutely or secondly.
- Database Users: By design the system is to be used by ***api***, via python/R or the C# visual studio Harmonixe.exe application. The users do not need other than public access to the database, and it should be enough to run all import and extract procedures no matter if you are using python or R or Harmonize.exe
- By doing this, we ensure no bad queries are executed, and the system will perform fast and smoothly, and metadata will be updated according to design ( ie updated date)



## Step 2 — Database Connection Configuration

- Edit *connection.txt*. The first line must be connection string to your SQL Server database with a trusted connection not requiring database username and password. If using a trusted connection, all users can use the Harmonize files from the same shared folder. This is the best and safest set-up, and it will be simpler to upgrade to later versions. The file must be named *connection.txt*. Personal user ids and passwords are also OK, but then the application need to installed locally for each user.
- Choose where **local chart data** will be stored (*MyData.js*). Default folder is: **C:/Harmonized/Charts/** - if this is changed this path needs to be changed in the 3 html files: *Chart*, *MultiChart*, and *YearChart*, and *Report.html*. Initially let the directory and files be unchanged until you have Harmonize up and running.
- Recommendation: use connection mode as shown in *connection.txt* for **trusted connections**.

```
GetCurve2python.py | Mydata.js | connection.txt | getisonCurve.py | FFtestfile.csv
1 Data Source=localhost\MSSQLSERVER2022;Connection Timeout=5;Initial Catalog=Harmonize;Integrated Security=True;
2 C:\Harmonized\Charts\
3 English;Albanian;Kenyan;Norwegian;гармонізувати;تونسجم;Hindi
4 0
5 1000
6 -----
7 --the below connection strings are not un use, connection details must be at line #1
8 --samples below: Best to use a connection string without password
9 Data Source=localhost\MSSQLSERVER2022;Connection Timeout=5;Initial Catalog=Harmonize;User ID=Erik;Password=MyPas
10 Data Source=localhost\MSSQLSERVER2022;Initial Catalog=Harmonize;Integrated Security=True;
11 Data Source=localhost\MSSQLSERVER2022;Connection Timeout=15;Initial Catalog=Harmonize;Integrated Security=True;
```

## Step 3 — Using the Application

- Run **Harmonize.exe**, a **shortcut** should be available on your desktop.
- Verify that the application, list a tree with datasets:
- **Test Help, Release** from top menu to verify that the application can open your default browser, and display the data. If this does not work It will not work to show charts either.
- Generate charts & Reports using:
  - **Chart, MultiChart, YearChart** is under the Chartmenue
  - **User Report button for quick horizontal & vertical reports**
  - **Report Tables also available from the inside the Charts**
- Charts are rendered in the default **browser** (Chrome recommended but Harmonize uses your default browser. You need to have a browser as a default application to open html files.)
- Modify templates as needed: (not needed but possible to customize)
  - Change fonts, colors, legends, tooltips
  - Can modify Harmonize.css so it fits your standards.
  - Use Highcharts or another compatible library
- The C# application overwrites **MyData.js** each time charts are generated. Copy it elsewhere if you need to preserve data. If so, you may need to copy one of the templates Chart.html to point to your local files. You may create your own html templates. It's also possible to change and customize all the html files.
- **Important: YearChart template:** only use intervals containing data up to one year (e.g., CurrentYear-1, CurrentYear-2) More Intervals can be added into the database.

файл **Діаграма** Опції звіт Адмініструвати Довідка

гармонізувати

символ % підрядок % **Діаграма** гармонізувати

идент	ім'я	опис	дані	частота	одичця	Інтернет	джерело	Оновлено	Ном
101648	CPI_NO.CTOTAL.IDX	All-Item index	16	M	IDX	https://data.asb...	2015=100	2025-12-30 14:28	102
101649	CPI_NO.C01.IDX	Food and non-alcoholic beverages	16	M	IDX	https://data.asb...	2015=100	2025-12-30 14:28	102
101650	CPI_NO.C02.IDX	Alcoholic beverages and tobacco	16	M	IDX	https://data.asb...	2015=100	2025-12-30 14:28	102
101651	CPI_NO.C03.IDX	Clothing and footwear	16	M	IDX	https://data.asb...	2015=100	2025-12-30 14:28	102
101652	CPI_NO.C04.IDX	Housing, water, electricity, gas and other...	16	M	IDX	https://data.asb...	2015=100	2025-12-30 14:28	102
101653	CPI_NO.C05.IDX	Furnishings, household equipment and ro...	16	M	IDX	https://data.asb...	2015=100	2025-12-30 14:28	102
101654	CPI_NO.C06.IDX	Health	16	M	IDX	https://data.asb...	2015=100	2025-12-30 14:28	102
101655	CPI_NO.C07.IDX	Transport	16	M	IDX	https://data.asb...	2015=100	2025-12-30 14:28	102
101656	CPI_NO.C08.IDX	Communications	16	M	IDX	https://data.asb...	2015=100	2025-12-30 14:28	102
101657	CPI_NO.C09.IDX	Recreation and culture	16	M	IDX	https://data.asb...	2015=100	2025-12-30 14:28	102
101658	CPI_NO.C10.IDX	Education	16	M	IDX	https://data.asb...	2015=100	2025-12-30 14:28	102
101659	CPI_NO.C11.IDX	Restaurants and hotels	16	M	IDX	https://data.asb...	2015=100	2025-12-30 14:28	102
101660	CPI_NO.C12.IDX	Miscellaneous goods and services	16	M	IDX	https://data.asb...	2015=100	2025-12-30 14:28	102
101661	CPI_NO.C01.1.1.1_11111.IDX	Rice	16	M	IDX	https://data.asb...	2015=100	2025-12-30 14:28	102

идент	ім'я	опис	Колір	Ширин	Пунктирн	вісь	функція	крок	Інтервал	агрегатив	Тип	Укладана	Сорту
101654	CPI_NO.C06.IDX	Health	Blue	5	solid	Left	None	1	YearsLast10	None	spline	None	1
101655	CPI_NO.C07.IDX	Transport	Beige	5	solid	Left	None	1	YearsLast10	None	spline	None	2
101657	CPI_NO.C09.IDX	Recreation and culture	Red	5	solid	Left	None	1	YearsLast10	None	spline	None	3
101656	CPI_NO.C08.IDX	Communications	Green	7	dot	Left	None	1	YearsLast10	AVG_YEAR	spline	None	4

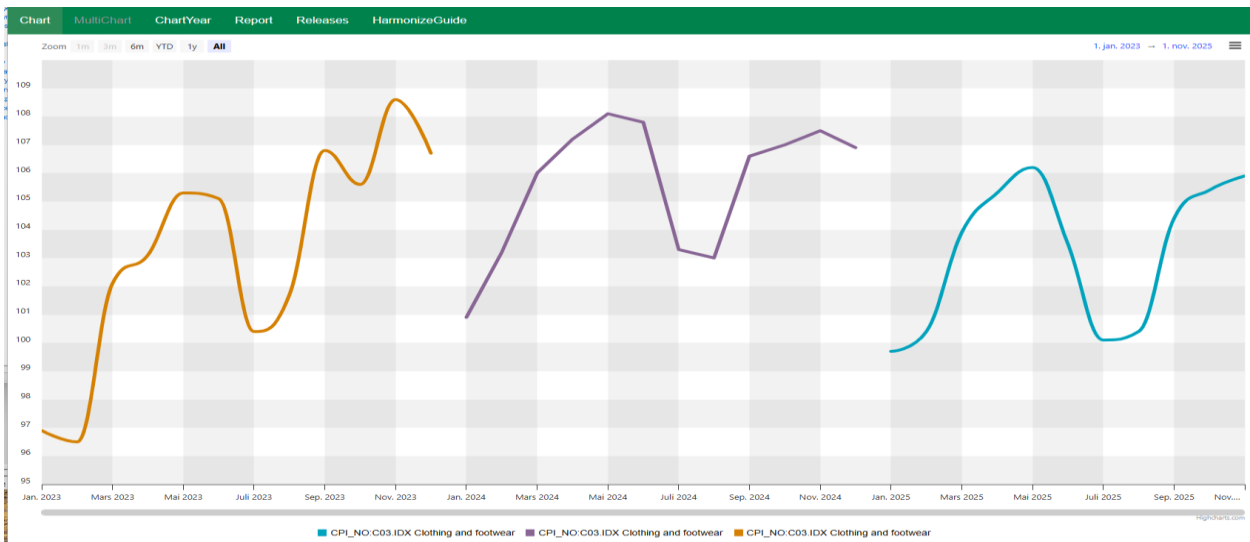
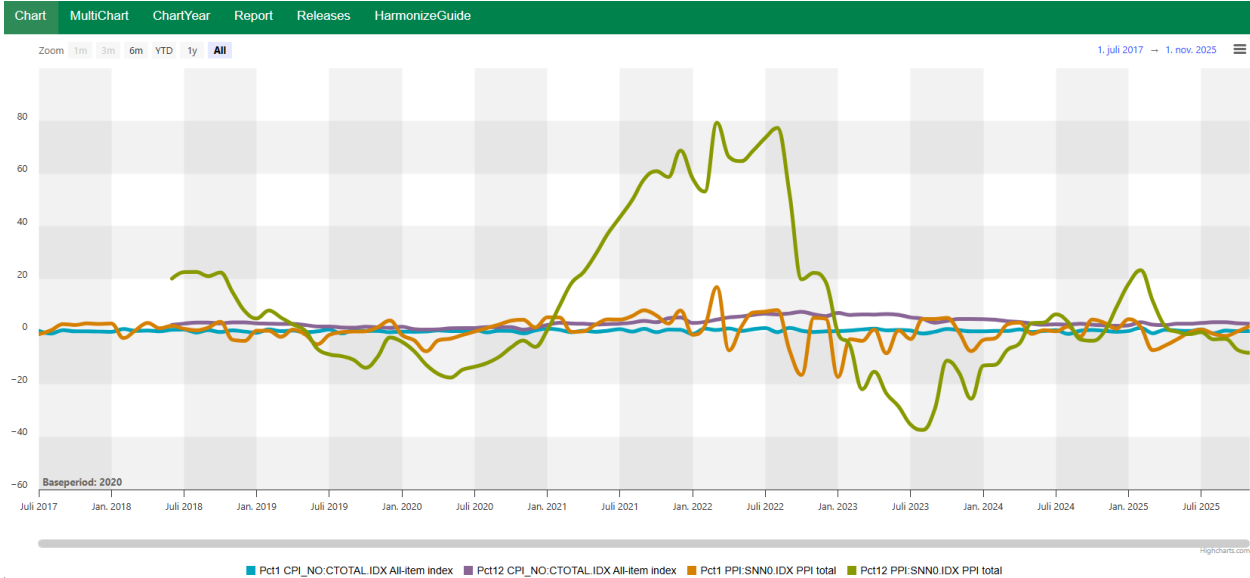
Діаграма Діаграма звіт **Загальна основа**  All [01-12]  01  02

4 of 17 Series Selected Useniks Data Source=localhost\MSSQLSERVER2022;Connection Timeout=5;Initial Catalog=Harmonize;Integrated Security=True;

## Step 4 — Template for the Chart & Report options

### Chart.html (Template for n series in 1 container)

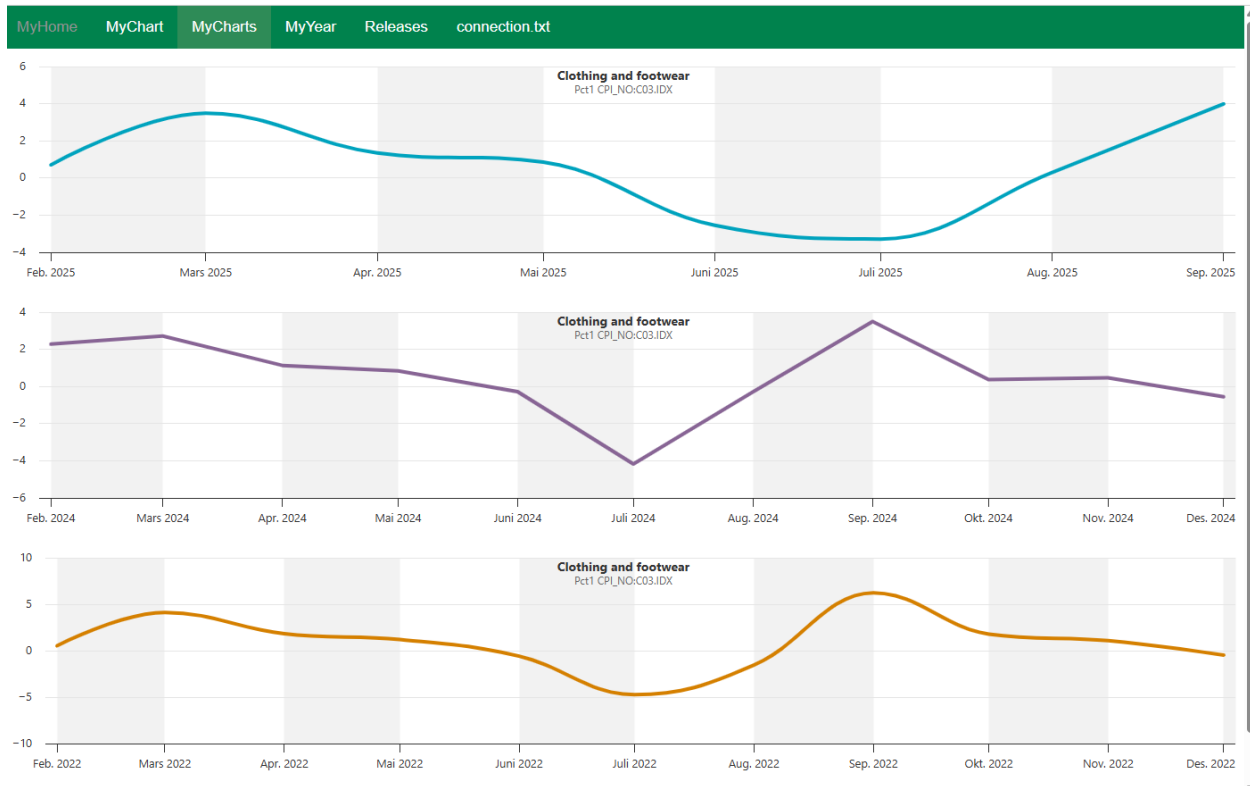
The main template takes all your selected series and chart them in one container. To compare more series, you may choose various functions and aggregations, as well as common base year functionality. Series may be stored in different datasets, and you may use different chart styles such as line, spline, area & column. Charts are zoomable.



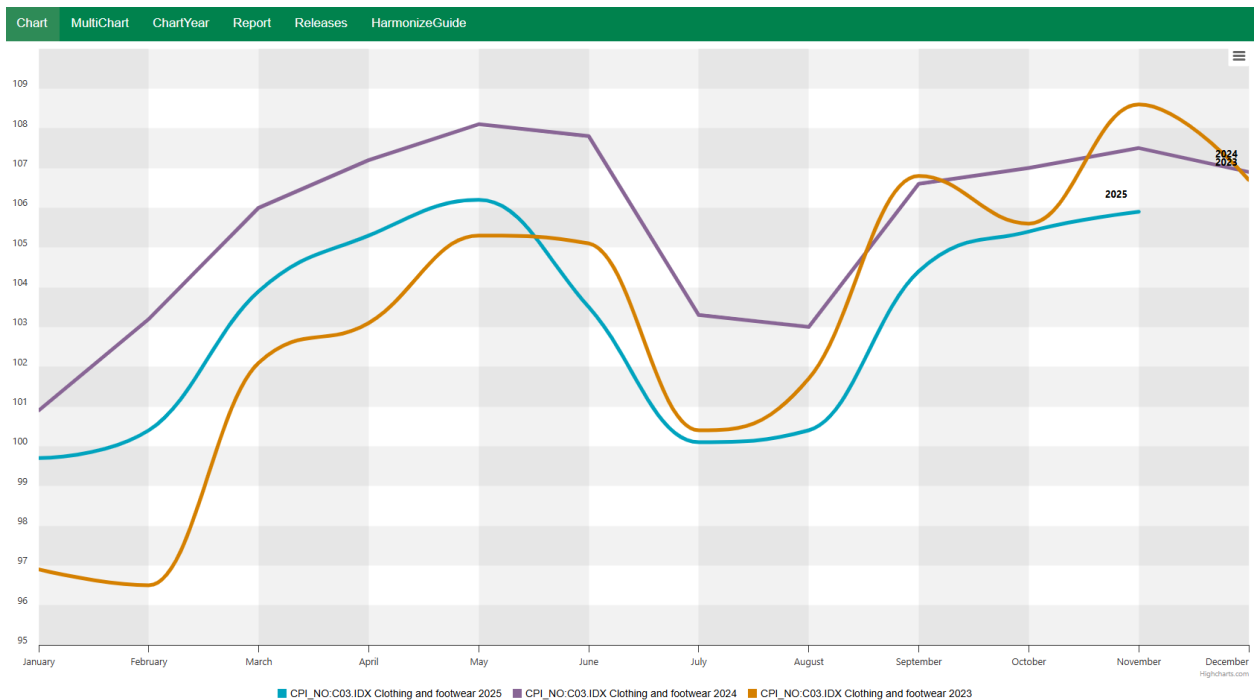
## MultiChart.html (Template for n charts in separate containers)

MultiChart, will chart n series in **n** containers, you will see approximately 3 charts on each page, scroll down if more charts are available. The n charts are independent and not synchronized based on the x-axis.

Currently there are no print or view data as table for this template, this can easily be added in the MultiChart.html



## YearChart.html – overlay ( all Series need to use intervals containing one year)



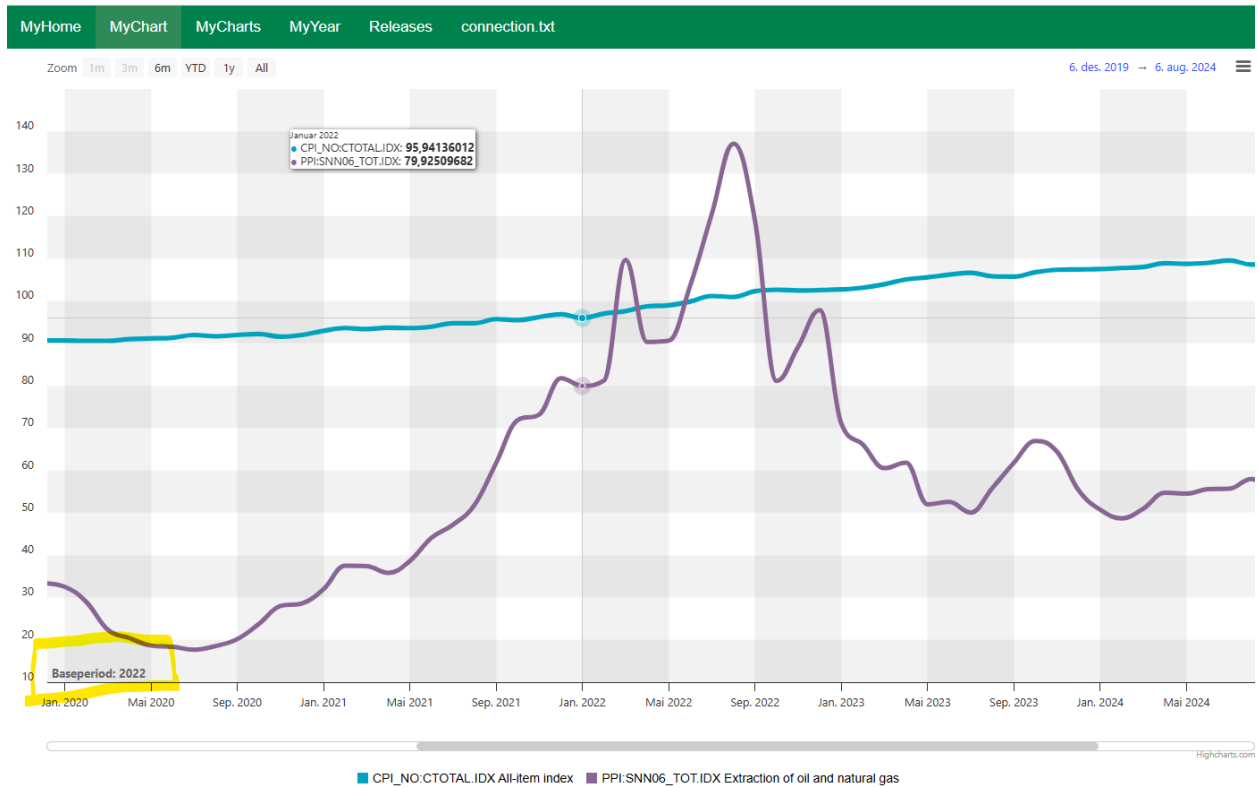
The ChartYear template is only usable when used as above and correct intervals are used. A yearly label is shown in labels and legends to more easily differ among the different years.

All charts can be viewed as a table, or saved as csv, se the small hamburger menu located in the top right corner in your charts.

Month	CPI_NO:C03.IDX 2025	CPI_NO:C03.IDX 2024	CPI_NO:C03.IDX 2022
January	99.7	100.9	94.4
February	100.4	103.2	94.9
March	103.9	106	98.8
April	105.3	107.2	100.6
May	106.2	108.1	101.8
June	103.5	107.8	101.2
July	100.1	103.3	96.4
August	100.4	103	94.9
September	104.4	106.6	100.8
October		107	102.6
November		107.5	103.7
December		106.9	103.2

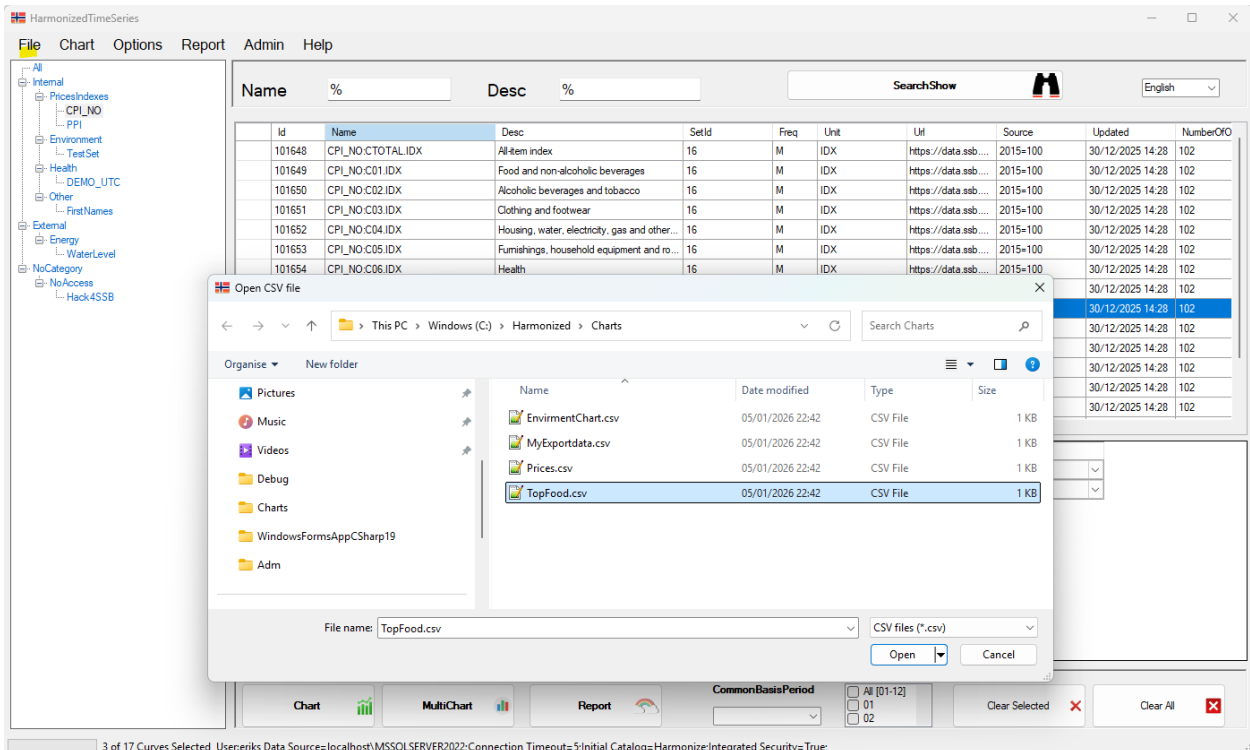
## Common base year

When common base period is used, this will be printed in your charts, be aware common base year can be combined with function and aggregates. The year selected as the common year need to have data observation(s). The sample below compared CPI and PPI, 2 indexes that have different base year, now using common base year 2022 = 100.



## Application tricks & techniques

- When searching for series you can hold shift key down and select several series in one go. The series will then move to the selected area, and the Chart /Report options will be enabled.
- In the selected area, you can right click, and apply interval, function etc to all series
- The order column is used for sorting; by clicking on the column headers, you may sort on any column, or you can specify an order number to sort on.
- Hidden under the File menu, you can save your chart selection, with intervals, functions and all the information in the selected area. **Save** the selection.csv on your computer to recreate the chart with **fresh** data, at later point in time.
- Be aware of changes in the series names or change of access to the data since you saved your definition may cause some issues.
- # of Decimals and date formats can be selected under the Options menu.
- Shortcuts, Harmonize standard shortcuts are Alt+C => Chart, Alt+M => Multichart, Alt+R => Report to execute a Charts /Report. The application will always extract the newest data from the database before displaying it.



## Sorting and Ordering

In the top DataGrid you may sort the series in the dataset on all columns, observe that the column Last Diff sort the dataset, based on which curves had the most / least change according to the previous observation.

The screenshot shows the HarmonizedTimeSeries application interface. The main window displays a data grid with columns: Id, Name, Desc, SetId, Freq, Unit, Url, Source, Updated, NumberOfObs, LastDiff, and Mir. The 'LastDiff' column is highlighted in yellow, indicating it is the current sort key. The data is sorted by 'LastDiff' in descending order, with the most negative values at the top.

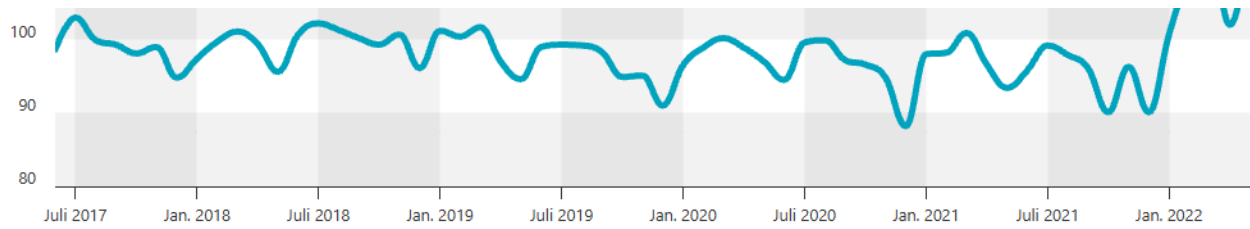
Id	Name	Desc	SetId	Freq	Unit	Url	Source	Updated	NumberOfObs	LastDiff	Mir
101664	CPI_NO.C01.2.1.1_12111.IDX	Coffee	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102	-3.20000000	201
101662	CPI_NO.C01.1.4.7_11471.IDX	Egg	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102	-2.90000000	201
101656	CPI_NO.C08.IDX	Communications	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102	-2.30000000	201
101653	CPI_NO.C05.IDX	Furnishings, household equipment and ro...	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102	-1.80000000	201
101655	CPI_NO.C07.IDX	Transport	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102	-1.70000000	201
101649	CPI_NO.C01.IDX	Food and non-alcoholic beverages	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102	-1.40000000	201
101657	CPI_NO.C09.IDX	Recreation and culture	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102	-1.10000000	201
101650	CPI_NO.C02.IDX	Alcoholic beverages and tobacco	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102	-0.20000000	201
101658	CPI_NO.C10.IDX	Education	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102	0.00000000	201
101648	CPI_NO.CTOTAL.IDX	All-item index	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102	0.20000000	201
101651	CPI_NO.C03.IDX	Clothing and footwear	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102	0.50000000	201
101650	CPI_NO.C12.IDX	Miscellaneous goods and services	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102	0.50000000	201
101661	CPI_NO.C01.1.1.1_11111.IDX	Rice	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102	0.80000000	201
101654	CPI_NO.C06.IDX	Health	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102	1.10000000	201

Below the data grid is a configuration table with columns: Id, Name, Desc, Color, Width, Style, Axis, Function, Step, Interval, Aggregate, Type, Stacking, and Order. The 'Color' column is highlighted in yellow.

Id	Name	Desc	Color	Width	Style	Axis	Function	Step	Interval	Aggregate	Type	Stacking	Order
101654	CPI_NO.C06.IDX	Health	Blue	5	solid	Left	None	1	YearsLast 10	None	spline	None	1
101655	CPI_NO.C07.IDX	Transport	Beige	5	solid	Left	None	1	YearsLast 10	None	spline	None	2
101657	CPI_NO.C09.IDX	Recreation and culture	Red	5	solid	Left	None	1	YearsLast 10	None	spline	None	3
101656	CPI_NO.C08.IDX	Communications	Green	7	dot	Left	None	1	YearsLast 10	AVG_YEAR	spline	None	4

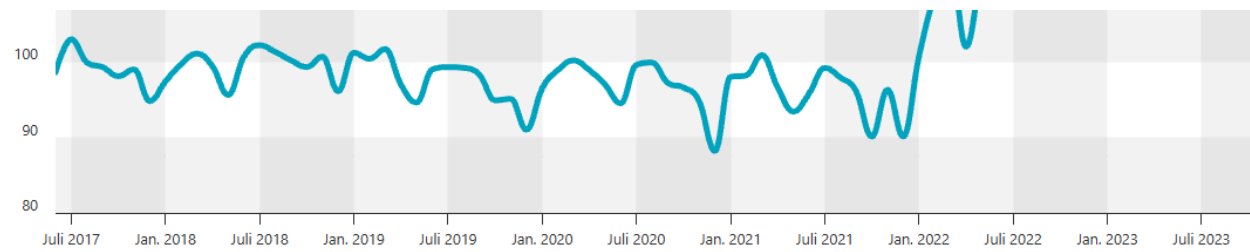
The interface also includes a menu bar (File, Chart, Options, Report, Admin, Help), a search bar, and a status bar at the bottom indicating '4 of 17 Series Selected'.

When viewing as table, clicking at Header you easily find max and min point for the series. (This is why the Date is not sorted: but the max value is September 2025.



DateTime	CPI_NO:C01.2.1.1_12111.IDX
2025 09 01 00:00	170
2025 07 01 00:00	169
2025 10 01 00:00	163.8
2025 11 01 00:00	160.6
2025 06 01 00:00	158.7
2025 08 01 00:00	155.4
2025 05 01 00:00	147.2
2025 01 01 00:00	139.6

Min point:



DateTime	CPI_NO:C01.2.1.1_12111.IDX
2020 12 01 00:00	88.2
2021 10 01 00:00	90.1
2021 12 01 00:00	90.1
2019 12 01 00:00	91
2021 05 01 00:00	93.4
2020 06 01 00:00	94.5
2019 05 01 00:00	94.6
2017 12 01 00:00	94.8
2020 11 01 00:00	94.8
2019 10 01 00:00	94.9

## Menus and Languages

- Edit *Menus.csv* for custom language labels.
- **Do not remove lines or change the order in Menus.csv.** Backup the original file before editing.

KohaEUnifikuar

Skedar Grafikë Opsione Raport Admin Ndihmë

Joker % Nënvarg % Kërko Datafaq Albanian

Id	Emër	Përshkrim	Vendosid	Frekuen	Njësi	Url	Burim	Perditësuar	NumriVezhime	LastDiff	Mir
101664	CPI_NO.C01.2.1.1_12111.IDX	Coffee	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102	-3.20000000	201
101662	CPI_NO.C01.1.4.7_11471.IDX	Egg	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102	-2.90000000	201
101656	CPI_NO.C08.IDX	Communications	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102	-2.30000000	201
101653	CPI_NO.C05.IDX	Furnishings, household equipment and ro...	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102	-1.80000000	201
101655	CPI_NO.C07.IDX	Transport	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102	-1.70000000	201
101649	CPI_NO.C01.IDX	Food and non-alcoholic beverages	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102	-1.40000000	201
101657	CPI_NO.C09.IDX	Recreation and culture	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102	-1.10000000	201
101650	CPI_NO.C02.IDX	Alcoholic beverages and tobacco	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102	-0.20000000	201
101658	CPI_NO.C10.IDX	Education	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102	0.00000000	201
101648	CPI_NO.CTOTA.LIDX	All-item index	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102	0.20000000	201
101651	CPI_NO.C03.IDX	Clothing and footwear	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102	0.50000000	201
101660	CPI_NO.C12.IDX	Miscellaneous goods and services	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102	0.50000000	201
101661	CPI_NO.C01.1.1.1_11111.IDX	Rice	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102	0.80000000	201
101654	CPI_NO.C06.IDX	Health	16	M	IDX	https://data.ssb...	2015=100	2025-12-30 14:28	102	1.10000000	201

Id	Emër	Përshkrim	Ngjyre	Gjerësia	Vije	Boshet	Funkcion	Hap	Interval	Agregat	Lloj	Shtresim	Rendit
101654	CPI_NO.C06.IDX	Health	Blue	5	solid	Left	None	1	YearsLast10	None	spline	None	1
101655	CPI_NO.C07.IDX	Transport	Beige	5	solid	Left	None	1	YearsLast10	None	spline	None	2
101657	CPI_NO.C09.IDX	Recreation and culture	Red	5	solid	Left	None	1	YearsLast10	None	spline	None	3
101656	CPI_NO.C08.IDX	Communications	Green	7	dot	Left	None	1	YearsLast10	AVG_YEAR	spline	None	4
101658	CPI_NO.C10.IDX	Education	Dark Blue	5	solid	Left	None	1	YearsLast10	None	spline	None	5
101651	CPI_NO.C03.IDX	Clothing and footwear	Orange	5	solid	Left	None	1	YearsLast10	None	spline	None	6
101648	CPI_NO.CTOTA...	All-item index	Red	5	solid	Left	None	1	YearsLast10	None	spline	None	7
101650	CPI_NO.C02.IDX	Alcoholic beverages and to...	Olive	5	solid	Left	None	1	YearsLast10	None	spline	None	8
101650	CPI_NO.C02.IDX	Alcoholic beverages and to...	Turquoise	5	solid	Left	None	1	YearsLast10	None	spline	None	9

Grafikë ShumëGrafikë Raport Bazë

9 of 17 Series Selected Usereniks Data Source=localhost:MSSQLSERVER2022;Connection Timeout=5;Initial Catalog=Harmonize;Integrated Security=True;

## Data management

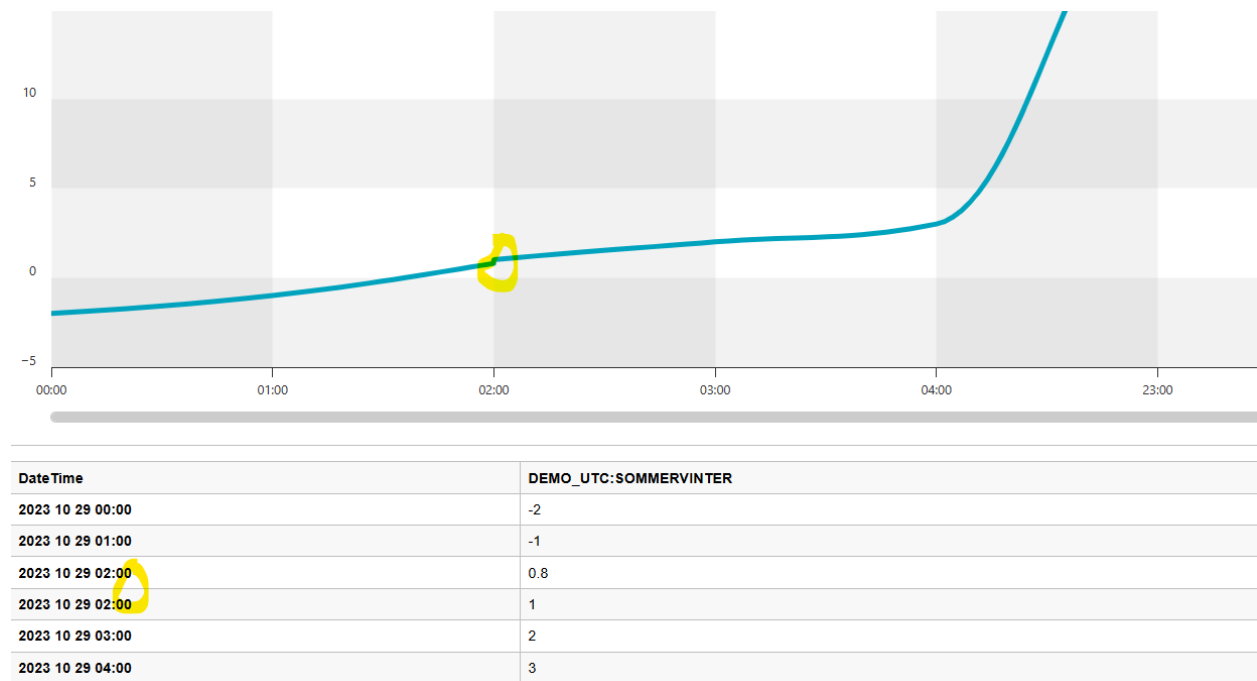
- Harmonize calls **SQL stored procedures** to generate `MyData.js`.
- Sample Python scripts are included for importing or updating data.
- Units are standardized via **Unit IDs**, editable in the *Admin* form or directly in the database.
- Interval may be added to the View inside the database, sql logic. The procedures using the intervals will query data that is **GE start\_date and LT end\_date**
- Additional datasets should be defined from admin, they can also be put in a tree, which is displayed leftmost inside the application.
- Utility procedures are included for deleting data and creating new datasets.
- The time series may be stored in many different tables; the data tables need to be in the same format and contain a column *value\_date* in date or datetime. Choose date if you do not have hourly data.

## Timezones and day light saving

When having higher frequencies such as hourly, and need to manage summer and wintertime, the system can handle this. Data needs to be stored in UTC and in the Loadset table, the dataset needs to be configured to be displayed in a different time zone than UTC. Be aware that time zones are more complicated than just visualizing the data. When you do aggregation, the system converts time zone, before applying functions and aggregations such as average day.

ie hourly spot prices will have 25 observations (hours) when shifting to wintertime, but only 23 hours (see next page) when shifting from winter to summertime.

The chart below displays 2 observations on the hour 02:00, because the CET clock is set back by one hour once a year.



In the dataset configuration the dataset above is stored in UTC, but the series from this dataset is displayed in Central European time.

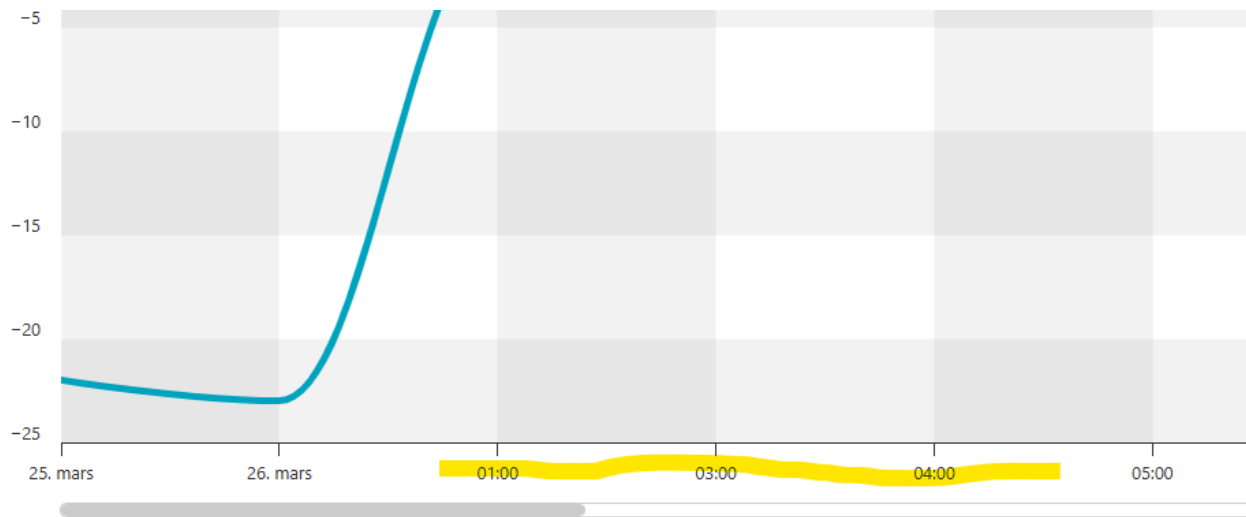
**Harmonize Browser** [About] [Exit]

- Harmonize
- Read Tables
- Loadset
- Unit
- CurveUseLog
- DataTable
- DataType
- LGroup
- LoadsetADr
- LoadsetADw
- Views
- IntervalV

Id	Name	Unit	Freq	Source	TableId	Active	AccessAll	PlatformOwner	Busi	Interval	HerChic	parent	C2Timezone	Updated	UpdatedBy
1	DEMO.UTC	eHub	D	testutc	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Erik		1	10	1	Central European...	21/12/2025 23:45	Erik
2	أخرى	Arab	A	انتشارالتفاح	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Erik		10	10	1		21/12/2025 23:45	Erik
3	FirstNames	https://data.ssb...	A	ssb	2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			1	12	1		26/12/2025 22:26	sa
6	WaterLevel	www.nve.no	W	nve	2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	test		10	21	2		21/12/2025 23:45	Erik
7	Україна	www.Україна.	A	onera	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			1	31	1		21/12/2025 23:45	Erik
8	Hack4SSB	http://ssb.no	M	test	38	<input checked="" type="checkbox"/>	<input type="checkbox"/>	missing read acc...		1		1		02/01/2026 23:40	MicrosoftAccount...
11	PPI	statbank.table/1...	M	2021=100	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			10	10	1		21/12/2025 23:46	Erik
14	TestSet	test flt	TBC	employment	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Eriks		1	11	1		23/12/2025 16:55	Erik
16	CPI_NO	https://data.ssb...	M	2015=100	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Erik		10	10	1		21/12/2025 23:46	Erik

When having hourly data, the report information may be confusing as the standard report template use a date format year month day, but this can easily be changed to contain hours and or minutes or seconds as well.

Below, observe the gap x-axis when chart/reporting an hourly series in the winter to summer shift.



Date Time	DEMO.UTC:VINTER SOMMER
2023 03 25 23:00	-22
2023 03 26 00:00	-23
2023 03 26 01:00	0
2023 03 26 03:00	1
2023 03 26 04:00	2
2023 03 26 05:00	3
2023 03 26 06:00	4

## Error messages:

- **Cannot connect to server**, verify username and password, or the trusted connection, if possible, try with sql management studio for better error messages, or login with an admin user to see if password has expired.
- When installing / reinstalling, it may be the installer is not able to remove previous installation, then settings, App – Uninstall Harmonize ‘manually’
- Cannot update /”upsert” data into the database. This is problem related to database access. When running the application with sa (sysadmin) you do not necessarily have write access to the database. The access-all flag in the *loadset* table indicates whether all users have read access to the dataset. If/ When not all users should have access, the table called LoadsetADr, configure which users have access to which loadset = dataset.
- The table LoadsetADw will indicate which users have write access to the datasets. Be aware that logging into the database with trusted connection using mssql management, may not be the same username as when logged in via trusted connection using Python. When using python your trusted user is typically the username printed with the *cmd* windows- command ***whoami***. Users who need write access to the datasets must be defined in the table *LoadsetADw*. *To shortcut the installation and get started process, all users typically have write access to the database. The write access functionality is defined in the database function IsAccesssw. The content of the table LoadsetADw shown below gives you the idea.*

## Harmonize Browser

- Hamonize
  - Read Tables
    - Loadset
    - Unit
    - CurveUseLog
    - Data Table
    - Data Type
    - LSGroups
    - LoadsetADr
    - LoadsetADw
  - Views
    - IntervalV

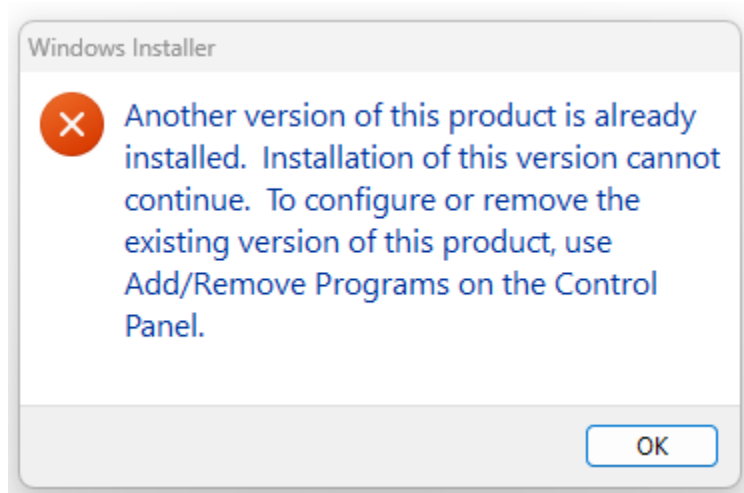
LoadSetId	username	UpdatedDate Time	Method	Active
1	esb-5CD150134E\veriks			<input checked="" type="checkbox"/>
6	ExeUser			<input checked="" type="checkbox"/>
8	Microsoft Account\verik...		mssql	<input checked="" type="checkbox"/>
8	esb-5CD150134E\veriks		python	<input checked="" type="checkbox"/>
9	DBowner			<input checked="" type="checkbox"/>
10	DBowner			<input checked="" type="checkbox"/>
10	ExeUser			<input checked="" type="checkbox"/>
11	esb-5CD150134E\veriks		python	<input checked="" type="checkbox"/>
16	esb-5CD150134E\veriks		cpi	<input checked="" type="checkbox"/>
*				<input type="checkbox"/>

- No Access **or no rows/data in selected intervals**. Make sure you have data in the selected interval. If your interval is the year 4 years ago, and there is no data, you will get this warning. Here you must change the interval, also be aware of the metadata indicating the start and last observation, also be aware charting a series with one only observation, the chart may look empty because it's only one point. This error may also occur if you have selected a common base year or a function that requires data in a interval, that does not exist or is empty.

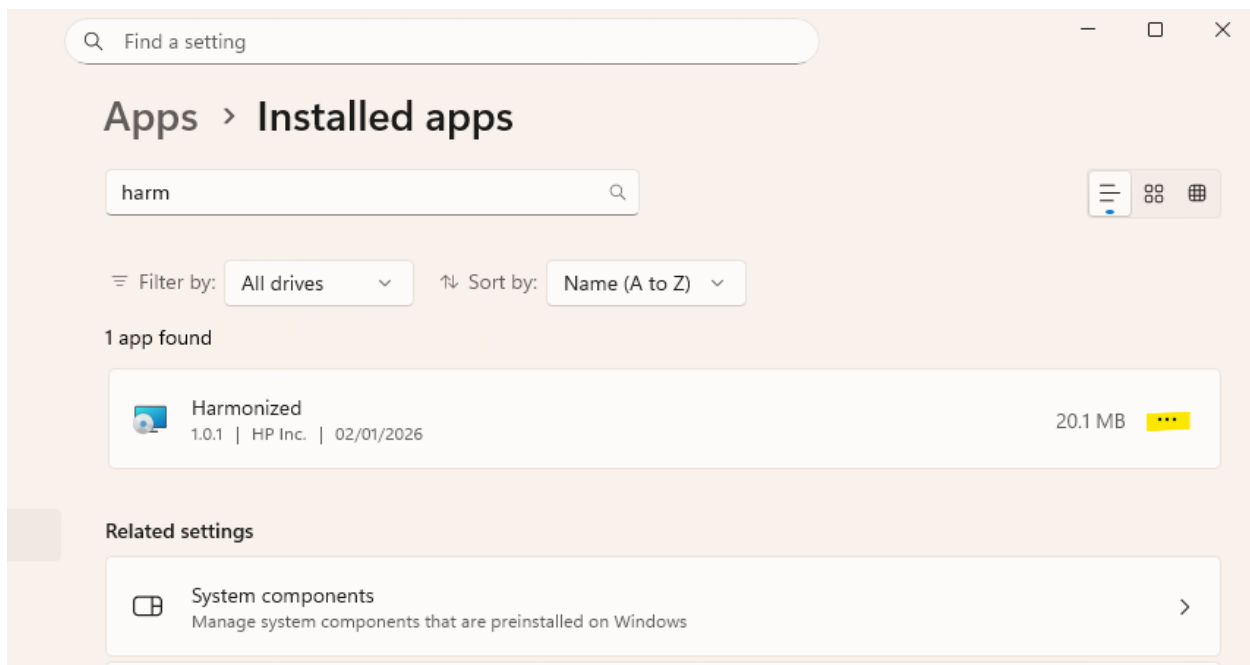
The screenshot shows the HarmonizedTimeSeries application window. On the left is a tree view of data sources. The main area displays a table with columns: loadSetId, Freq, Unit, Unit, Source1, Updated, NumOfObs, LastDiff, MinDate, MaxDate, and Interval. A dialog box is open over the table with the message: "Curve : 101437 No rows in selected Interval or Access Denied". Below the table is a configuration bar with fields for Id, Name, Desc, Axis, Function, Step, Interval, Aggregate, Type, and Stacking.

loadSetId	Freq	Unit	Unit	Source1	Updated	NumOfObs	LastDiff	MinDate	MaxDate	Interval
101437	D	IDX	elhub	testutc	29/10/2025 12:07	1	50.00000000	01/05/2023	01/05/2023	AllData
	D	IDX	elhub	testutc	29/10/2025 12:07	12	-100.00000000	01/02/1753	01/09/2023	AllData
	D	IDX	elhub	testutc	29/10/2025 12:07	2	4.00000000	01/09/1990	01/09/1995	AllData
	D	IDX	elhub	testutc	29/10/2025 12:07	8				lata
	D	IDX	elhub	testutc	29/10/2025 12:07	29				lata
	D	Cedi	elhub	testutc	07/11/2023 10:34	1				lata
	D	Cedi	elhub	testutc	10/11/2023 10:11	745				lata
	D	Cedi	elhub	testutc	10/11/2023 09:05	1				lata
	D	Cedi	elhub	testutc	10/11/2023 09:20	1				lata
	D	Cedi	elhub	testutc	10/11/2023 09:59	4	2556.00900000	30/09/2022 22:00	29/10/2022 22:00	AllData
	D	Cedi	elhub	testutc	10/11/2023 09:59	1		30/10/2022	30/10/2022	AllData
	D	Cedi	elhub	testutc	10/11/2023 09:59	1		29/10/2022 23:00	29/10/2022 23:00	AllData
	D	Cedi	elhub	testutc	10/11/2023 09:59	1		29/10/2022 01:00	29/10/2022 01:00	AllData

- If setup is already installed, you will need to use windows add/remove applications and remove the Harmonize software. Then run the setup.exe again.



Windows + I, and Apps will take you to Installed Apps



## Notes and Best Practices

- **MyData.js** is overwritten with each chart update.
- Logic and computation mainly occur **inside the database**.
- Use a trusted connection to sql if possible
- C# application Harmonize is lightweight:
  - Calls stored procedures in the MSSQL database with parameters
  - Updates MyData.js for charts, the same MyData.js used for all templates, enabling you to just simply change template chart-multichart-report from the browser.
- Use python or R to modify and update data, use stored procedures that control the access rules

The application works without internet connection, but you must have access to a MSSql server to extract new data from a Harmonize database model.

# Python

## Import Update Upsert

A generic ffi.py flat file interface, comes with the system to provide generic upload of datafiles in a standard csv format, where comma is the separator. Commas may be included in text such as description or documentation but will need to be double quoted.

Typically, one dataset, will have same frequencies and date format, but there are no built-in restrictions for this. Data should be loaded in UTC time zone, where time zone conversions will apply.

**Same and similar upsert - functionality is available on right – click nodes in the tree. This does not require python, but a similar csv file.**

name	unit	date	value	desc	doc
CURVE	20	01/05/2023	147	test curve	ignored column 1
CURVE	20	01/06/2023	167	test curve	ignored column 1
DEMOCURVE	20	01/06/2023	125.1	demoe test	med luft
DEMOCURVE	20	01/07/2023	175.1	demoe test	med luft
KENYA	20	01/06/2023	125.1	test, comma test	med luft
KENYA	20	01/07/2023	175.1	test	med luft
GeorgsCURVE	20	01/07/2023	675.1	date sjekk hist	med luft
GeorgsCURVE	20	01/08/2023	775.1	date sjekk hist	med luft
GeorgsCURVE	20	01/09/2023	675.1	date sjekk hist	med luft
GeorgsCURVE	20	01/09/1920	920.1	date sjekk hist	med luft
GeorgsCURVE	20	01/01/1900	819	date sjekk hist	med luft
GeorgsCURVE	20	1889-09-01	891.1	date sjekk hist	med luft
GeorgsCURVE	20	1880-09-01	892.1	date sjekk hist	med luft
GeorgsCURVE	20	1850-09-01	893.1	date sjekk hist	med luft
GeorgsCURVE	20	1801-01-01	894.1	date sjekk hist	med luft
GeorgsCURVE	20	1780-09-01	895.1	date sjekk hist	med luft
GeorgsCURVE	20	1761-01-01	896.1	date sjekk hist	med luft
GeorgsCURVE	20	1753-02-01	897.1	date sjekk hist	med luft
moss	20	01/09/1990	895.1	this works sjekk h...	med luft
moss	20	01/09/1995	899.1	this works sjekk h...	med luft
sommervinter	20	2023-10-28T22:00:00	-2	lagret as utc	hei
sommervinter	20	2023-10-28T23:00:00	-1	lagret as utc	hoi
sommervinter	20	2023-10-29T00:00:00	0.8	lagret as utc	hei
sommervinter	20	2023-10-29T01:00:00	1	lagret as utc	hoi
sommervinter	20	2023-10-29T02:00:00	2	lagret as utc	ho
sommervinter	20	2023-10-29T03:00:00	3	lagret as utc	ho
sommervinter	20	2023-10-29T22:00:00	22	lagret as utc	ho

```

Windows PowerShell
PS C:\HarmonizeCode\py> python.exe .\ffi.py DEMO_UTC .\FFItestfile.csv
Uploading to loadset: DEMO_UTC
Input file: .\FFItestfile.csv

✔ Completed successfully
Rows processed: 57
Elapsed time: 0.63 seconds
Updating the Stats for : DEMO_UTC
End
PS C:\HarmonizeCode\py>

```

The screenshot shows the HarmonizedTimeSeries application interface. On the left is a tree view of categories including Internal, Prices/Indexes, Environment, Health, External, Energy, and NoCategory. The main area displays a table of datasets with columns: Id, Name, Desc, LoadSetId, Freq, Unit, UH, Source, Updated, and NumOfObs. Below this is a configuration table for selected datasets with columns: Id, Name, Desc, Axis, Function, Step, Interval, Aggregate, Type, Stacking, and Order. At the bottom, there are buttons for Chart, MultiChart, and Report, along with a CommonBasisPeriod dropdown and checkboxes for All [01-12], 01, and 02. A timeline at the very bottom shows years from 1735 to 2020.

Id	Name	Desc	LoadSetId	Freq	Unit	UH	Source	Updated	NumOfObs
101437	DEMO_UTC.CURVE	test curve	1	D	IDX	ehub	testutc	23/01/2026 22:16	4
101438	DEMO_UTC.DEMOUCURVE	demoe test	1	D	IDX	ehub	testutc	23/01/2026 22:16	4
101439	DEMO_UTC.GEORGS CURVE	date sjekk hist	1	D	IDX	ehub	testutc	23/01/2026 22:16	16
101440	DEMO_UTC.MOSS	this works sjekk hist	1	D	IDX	ehub	testutc	23/01/2026 22:16	4
101441	DEMO_UTC.SOMMERSOMMER	Saved as utc	1	D	IDX	ehub	testutc	23/01/2026 22:16	8
101442	DEMO_UTC.VINTERSOMMER	Saved as utc winter	1	D	IDX	ehub	testutc	23/01/2026 22:16	29
101443	DEMO_UTC.NO3.68.201.USAGE_S	NO3.68.201.USAGE_S	1	D	Cedi	ehub	testutc	07/11/2023 10:34	1
101444	DEMO_UTC.NO1.68.201.USAGE_S	NO1.68.201.USAGE_S	1	D	Cedi	ehub	testutc	10/11/2023 10:11	745
101445	DEMO_UTC.NO6.68606.USAGE_S	NO6.68606.USAGE_S	1	D	Cedi	ehub	testutc	10/11/2023 09:05	1
101446	DEMO_UTC.NO7.68707.USAGE_S	NO7.68707.USAGE_S	1	D	Cedi	ehub	testutc	10/11/2023 09:20	1
101447	DEMO_UTC.NO1.68201.USAGE_S	NO1.68201.USAGE_S	1	D	Cedi	ehub	testutc	10/11/2023 09:59	4
101448	DEMO_UTC.NO2.68201.USAGE_S	NO2.68201.USAGE_S	1	D	Cedi	ehub	testutc	10/11/2023 09:59	1
101449	DEMO_UTC.NO2.68606.USAGE_S	NO2.68606.USAGE_S	1	D	Cedi	ehub	testutc	10/11/2023 09:59	1
101450	DEMO_UTC.NO2.68707.USAGE_S	NO2.68707.USAGE_S	1	D	Cedi	ehub	testutc	10/11/2023 09:59	1

After the file has been loaded into Harmonize. The system is using the name of the dataset as prefix, making it possible to have more versions of the dataset in the system, and compare them.

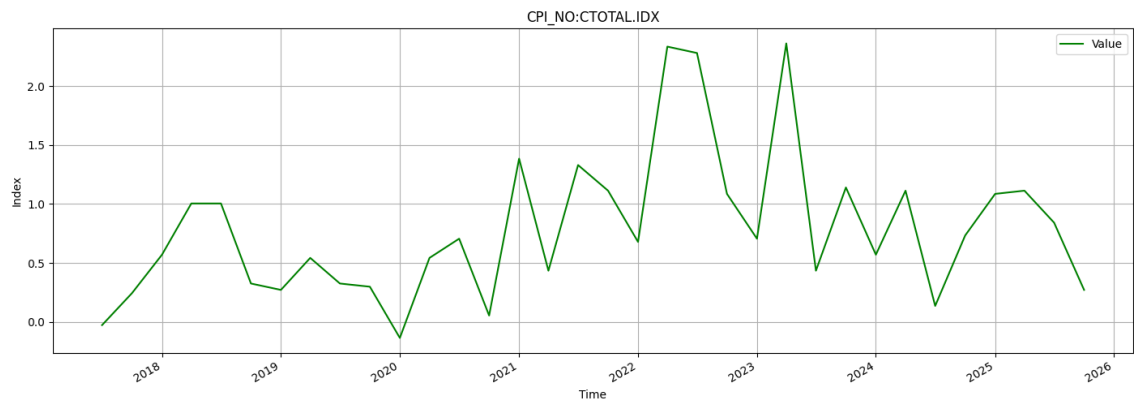
Note timeseries from year 1735 will cope with the x-axis and timeline. Other systems of struggle with extreme history like this.

## Export data using python.

Sample script to export data comes with the system. The procedure to get data is the exact same procedure as the Harmonize.exe application is using and will ensure same result, if used with the same parameters, such as interval function etc.

```
Windows PowerShell
[[{'Curveid': 101648, 'Name': 'CPI_NO:CTOTAL_IDX', 'Obs': [{'VDate': '2017-06-01T00:00:00', 'DynDate': '2017-06-01T00:00:00'}, {'VDate': '2017-07-01T00:00:00', 'DynDate': '2017-07-01T00:00:00', 'Value': -0.0271481, 'Epo': [1498867200000, -0.0271481]}, {'VDate': '2017-10-01T00:00:00', 'DynDate': '2017-10-01T00:00:00', 'Value': 0.24433284, 'Epo': [566816000000, 0.24433284]}, {'VDate': '2018-01-01T00:00:00', 'DynDate': '2018-01-01T00:00:00', 'Value': 0.57010995, 'Epo': [1514764800000, 0.57010995]}, {'VDate': '2018-04-01T00:00:00', 'DynDate': '2018-04-01T00:00:00', 'Value': 1.00447943, 'Epo': [1522540800000, 1.00447943]}, {'VDate': '2018-07-01T00:00:00', 'DynDate': '2018-07-01T00:00:00', 'Value': 1.00447944, 'Epo': [1530403200000, 1.00447944]}, {'VDate': '2018-10-01T00:00:00', 'DynDate': '2018-10-01T00:00:00', 'Value': 0.32577711, 'Epo': [1538352000000, 0.32577711]}, {'VDate': '2019-01-01T00:00:00', 'DynDate': '2019-01-01T00:00:00', 'Value': 0.27148093, 'Epo': [1546300800000, 0.27148093]}, {'VDate': '2019-04-01T00:00:00', 'DynDate': '2019-04-01T00:00:00', 'Value': 0.54726186, 'Epo': [1554197688000, 0.54726186]}, {'VDate': '2019-07-01T00:00:00', 'DynDate': '2019-07-01T00:00:00', 'Value': 0.32577711, 'Epo': [1562145600000, 0.32577711]}]]
```

Figure 1



```
from datetime import datetime
9 import matplotlib.pyplot as plt
10 import matplotlib.dates as mdates
11 #import matplotlib.dates
12 import json
13 #pip install matplotlib
14
15
16 #samples:
17 #StoredProc = "execute Harmonize..StpGetSeries 'CPI_NO:CTOTAL_IDX',2014,'Default',NULL,1,'json', 'NONE',1500, 'asc', 'NULL'"
18 #StoredProc = "execute StpGetSeries 'CPI_NO:CTOTAL_IDX',NULL,'AllData',NULL,1,'json', 'NONE',1500, 'asc', 'NULL'"
19 #StoredProc = "execute StpGetSeries 'CPI_NO:CTOTAL_IDX',NULL,'AllData',NULL,1,'json', 'NONE',1500, 'desc', 'NULL'"
20 #StoredProc = "execute StpGetSeries 'CPI_NO:CTOTAL_IDX',NULL,'YearsLast2',NULL,1,'json', 'NONE',1500, 'desc', 'NULL'"
21 #StoredProc = "execute StpGetSeries 'CPI_NO:CTOTAL_IDX',NULL,'YearsLast2',NULL,1,'json', 'AVG_QUARTER',1500, 'desc', 'NULL'"
22 #StoredProc = "execute StpGetSeries 'CPI_NO:CTOTAL_IDX',NULL,'YearsLast2',NULL,1,'json', 'AVG_QUARTER',1500, 'desc', 'NULL'"
23 #StoredProc = "execute StpGetSeries 'CPI_NO:CTOTAL_IDX',NULL,'YearsLast2','PCT(n)',1,'json', 'AVG_QUARTER',1500, 'desc', 'NULL'"
24 #StoredProc = "execute StpGetSeries 'CPI_NO:CTOTAL_IDX',NULL,'YearsLast2','[diff(n)]',1,'json', 'AVG_QUARTER',1500, 'desc', 'NULL'"
25 #StoredProc = "execute StpGetSeries 'CPI_NO:CTOTAL_IDX',NULL,'YearsLast2','[diff(n)]',1,'json', 'AVG_QUARTER',1500, 'desc', 'NULL'"
26 #baseyear and function
27 StoredProc = "execute StpGetSeries 'CPI_NO:CTOTAL_IDX',2022,'YearsLast10','[diff(n)]',1,'json', 'AVG_QUARTER',1500, 'desc', 'NULL'"
28
29
30
31 #sjd use ur built in login trusted connection, can be in separate file or use existing connection.txt
32 conn = pyodbc.connect('Driver={SQL Server};'
33                      'SERVER=localhost\\MSSQLSERVER2022;'
34                      'Database=Harmonize;'
35                      'Connection Timeout=5;'
36                      'Integrated Security=True;')
```

Sample calls from python, using different parameters.

## Utilities

To insert delete or update data, it's strongly recommended to use the Utility procedures in harmonize. This will ensure correct updating of automatic metadata, and use of existing write access mechanisms.

The procedures to *upsert* and delete data is available inside the database, as stored procedures. See also the python sample scripts to update the database correctly. In a timeseries database data observations must be stored with date or datetime, implying that storing information with a "date format" 2020M12 is not possible, but a proper date format like 2025-12-01 must be used. By storing the information in a correct manner, it then will be easier to compare information that may be stored in formats such as 2025, 2025M12 and 2025W52, making it impossible to compare without converting to date format.

- **DELETE\_DATA**

```
exec UTILS_Delete_Loadset 'DELETE_DATA', 7, 'NameofDatasetToBeDeleted'
```

The DELETE\_DATA option deletes all datapoints on all series on a dataset. The series names/ curvenames and the configuration of loadset will remain.

- **DELETE\_SERIES**

```
exec UTILS_Delete_Loadset 'DELETE_SERIES ',7, 'NameDatasetToBeDeleted'
```

The DELETE\_SERIES option deletes all datapoints on all series on a dataset as well as the names/ curvenames. However, the configuration of loadset will remain. This option is the best to use, when creation a *loadset*, but you find out you are not happy with the name of your series.

- **DELETE\_ALL**

```
exec UTILS_Delete_Loadset 'DELETE_ALL ',7, 'NameDatasetToBeDeleted'
```

The DELETE\_SERIES option deletes all datapoints on all series on a dataset as well as the names/ curvenames AND configuration of loadset. Be Careful. You need both the *Loadset\_ID* and *LoadsetName* as argument when executing *Util\_Delete\_loadset*.

- **CREATE LOADSET**

Creates a new loadset. This is typically just done once initially when creating a loadset. To rename or change the information on a loadset sql management server application is the recommended tool. However, to change information on a loadset users need to have permissions. A user who creates a loadset will by default also have permission to change this loadset.

- **PUTTIME**

Update or Inserts date to existing series or create new series if not already exists. The procedure will check id there already exist an observation, update the value if the value is different from existing valie. If no observation for the given serie+date(time) exists, a new record is inserted.

- **UPDATE STATISTICS**

Procedure to update number of observations, date of the first and last observations, updated time etc. The statistics is shown in the main window in the application.

# Harmonize SQLAddin

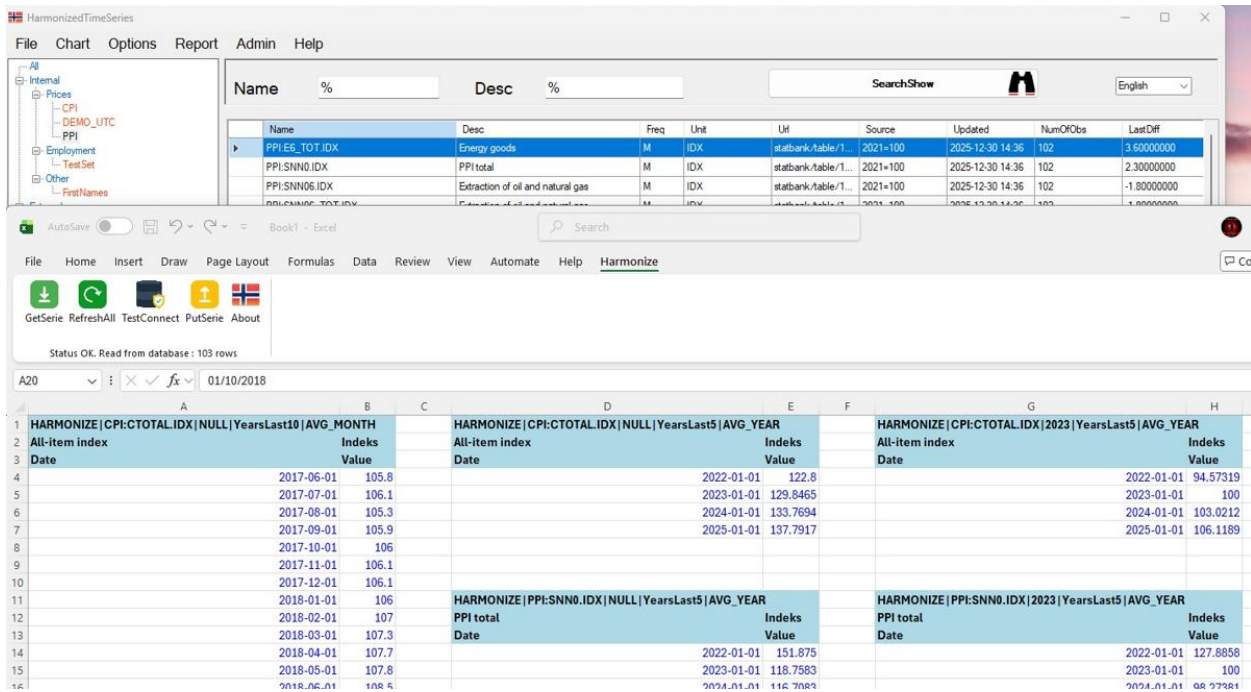
The Harmonize SQLAddin provides **get** and **put** data functionality. The Excel SQLAddin requires Excel and a successful installation of Harmonize in C:\Harmonize\App as the connection.txt must exist in this folder.

## Install Harmonize SQLAddin

Administrator rights are required to install the add-in. To install:

1. Extract the installation files to a temporary directory
2. Run **setup.exe**

After installation, the **Harmonize** ribbon will appear when you start Excel.



## Getting Started with SQLAddin

1. Select the **top-left cell** in your worksheet
2. Click **GetSerie**

A sample query will be inserted. This query works if you have access to the **CPI dataset**. You can copy and modify it as needed.

- **Refresh** → updates all query in the worksheet
- **GetSerie** → updates only the active cell

## Uploading from Excel / PutSerie

The **PutSerie** function allows you to upload data to a dataset.

- You must have **write access** to the dataset
- You can also update:
  - Description
  - UnitName (must be a valid UnitName defined in the database)

## GetSerie parameters and functions

The Harmonize GetSeries function uses the following arguments:

1. **Dataset and series name**  
Format: dataset:seriesname
2. **Base year**
3. **Interval**  
Must be a valid interval defined in the Harmonize database (customizable)

#### 4. Aggregation

Available options include:

- AVG\_MONTH
- AVG\_QUARTER
- SUM\_MONTH
- AVG\_YEAR

These correspond to the same interval options available in the application dropdown.

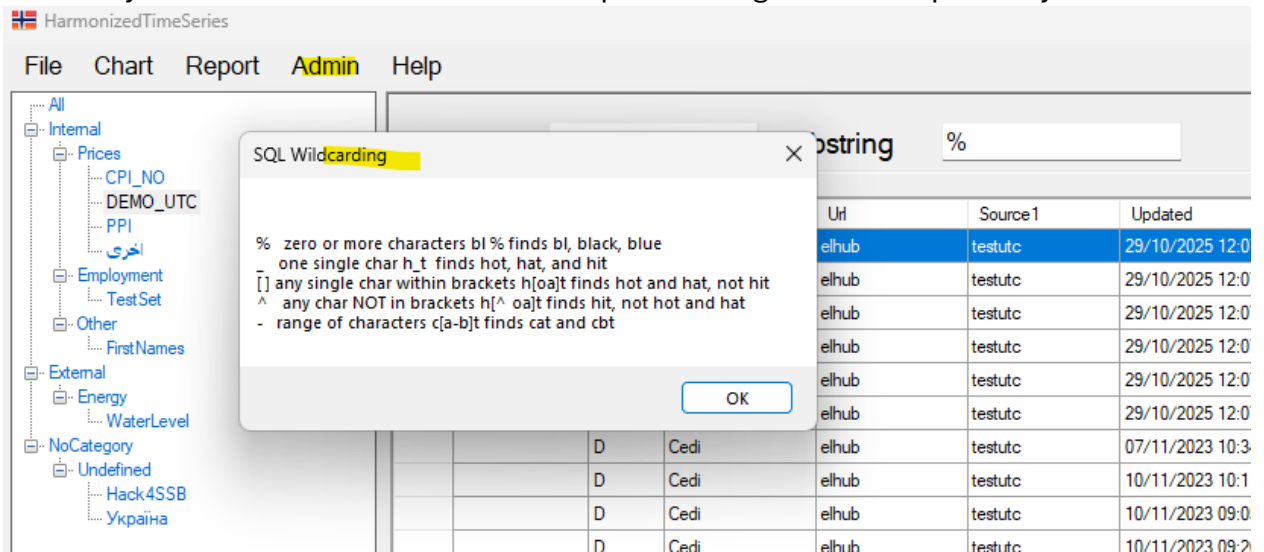
#### Notes

- Ensure dataset names, intervals, and unit names match those defined in the Harmonize database
- Upload operations will fail if permissions are insufficient

## Recommended Workflow & Checklist

- Set up the **SQL Server database**
- Install Harmonize (**Setup.exe**)
- Configure database connection details in: *connection.txt*
- Run application and generate charts verify, Multichart.html, and the Report.html
- All *html* files can be improved or customized, feel free.
- Possible to add extra languages
- Use sample python script to create your own to import your data for shared analytics
- The database by default let all users have access to all datasets by **Access all** flag in the *loadset* table, ( user access can be set by defining users and dataset, in the access tables LoadsetADr and LoadsetADw)
- Logging can be configured.
- If you do NOT have access to a dataset, the dataset will be listed in the tree, but no series will be listed when searching
- Be aware that wildcard and text search start searching from your position in the tree, if All is selected you will search all databases, if Prices group is selected you will search the databases in the Prices group.

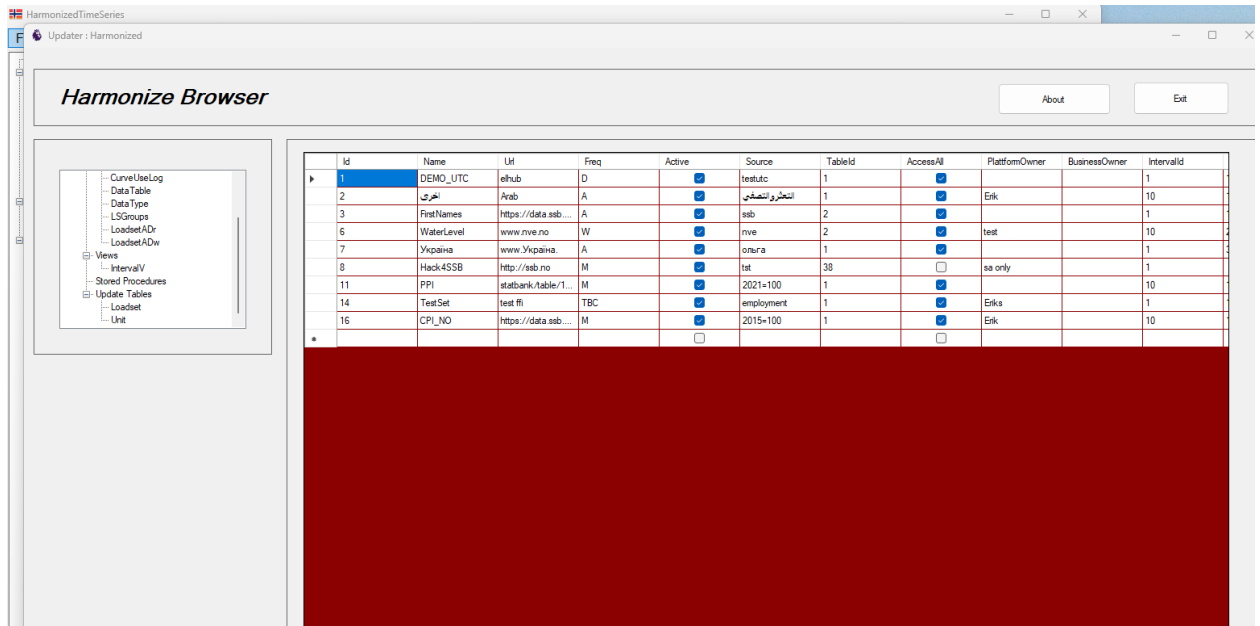
- Search by wildcard for names and/or descriptions using standard sql **LIKE** syntax.



- Functions coming with the system are Mave(n), Diff(n) and Pct(n), it's obviously possible to create and add your own customized functions, if the functions are in the same style and use the same parameters, returning the same format. Additional Functions can be placed in the database and will be available in the drop down inside the application.
- Similar, additional intervals can also be defined in the database, and all intervals defined will be selectable in the application. Make sure to use a default interval that is user friendly for most people, this is not necessarily All data

## Admin tool

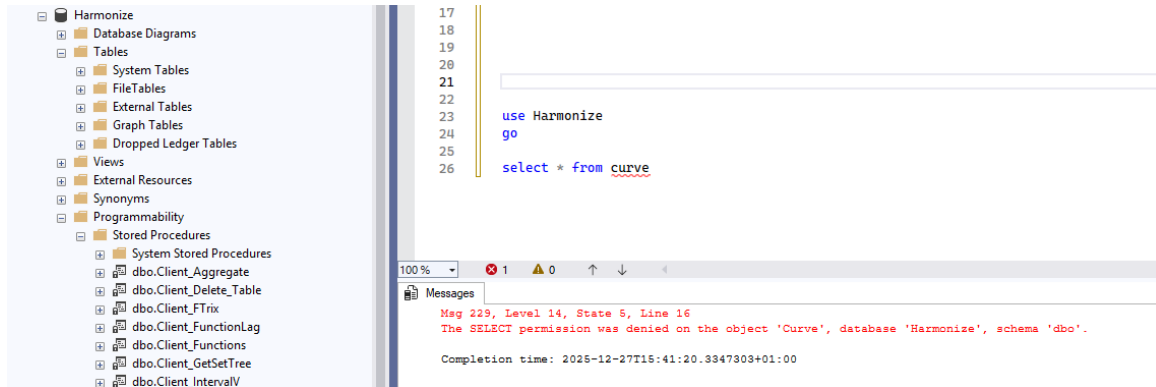
Admin is a browser for users to see some of the tables, and some of the tables can in theory be updated from here, but it's mainly a tool for viewing data such as units, access, intervals and more. The form should come up like this:



When you open the loadset table in Update mode – it will display in a red color mode. Depending on constraints on the various tables it is possible to do updates, but to update tables from sql management server will always be even better.

The advantage of the form is the use of sql procedures, making it possible for users to see data without select permissions.

## Appendix – create database user script



By design users cannot make pure selections like this, data tables may be huge, therefore only correct queries are recommended.

Create user script on the following page, need to be an administrator sa to execute

```

USE master;

GO

IF EXISTS (SELECT 1 FROM sys.server_principals WHERE name = 'demo')
BEGIN
    DROP LOGIN demo;
END

GO

CREATE LOGIN demo
WITH PASSWORD = 'YourStrongPass***...',
    CHECK_POLICY = ON,
    CHECK_EXPIRATION = OFF,
    DEFAULT_DATABASE = master;

GO

USE Harmonize;

GO

-- IMPORTANT after restore
ALTER AUTHORIZATION ON DATABASE::Harmonize TO sa;

GO

DROP USER IF EXISTS demo;

GO

CREATE USER demo FOR LOGIN demo;

GO

GRANT CONNECT TO demo;

GRANT EXECUTE TO demo;

GO

USE master;

GO

ALTER LOGIN demo WITH DEFAULT_DATABASE = Harmonize;

GO

```