

Library Guide

The tools added in library version 1.1. Each download works on its own: this page shows how to install a function, and each chapter says if a tool needs another one.

Install a Power Query function

1. Excel: **Data** → **Get Data** → **From Other Sources** → **Blank Query**. Power BI Desktop: **Home** → **Transform data** → **New Source** → **Blank Query**.
2. **Advanced Editor** → select everything → paste the whole content of the .pq file → **Done**.
3. Rename the query exactly as the file name without .pq , e.g. ECB_FX . Call it from other queries:
ECB_FX(#date(2026,1,1)) .

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Dependencies

Tool	Needs
ECB_FX, VIES_Check, SAP_UnpivotPeriods, Calendar_Workdays, Time Intelligence	Nothing else from the kit
Folder_Combine	Nothing. Only the SAP example uses SAP_CleanList (sold separately).
Open Items Aging	Nothing for manual use. The optional query on its Queries sheet uses SAP_CleanList (sold separately) and CNB_FX (free).

SAP_CleanList, CNB_FX and the Calendar_Workdays basics are described in the Starter Guide; the Budget vs. Actual tools and SAP_Export in the Pro Guide.

ECB_FX: euro reference rates

Daily ECB reference rates for every currency the ECB publishes, in the same shape as CNB_FX. Use it for group reporting in EUR; for Czech statutory booking keep CNB_FX, because Czech rules require the ČNB rate.

```
ECB_FX(#date(2026,1,1)) // all currencies, 1 Jan 2026 → today
ECB_FX(#date(2025,1,1), #date(2025,12,31), {"USD","PLN"}) // selected currencies and range
ECB_FX(#date(2026,1,1), null, {"CZK"}, false) // only days the ECB published
```

Column	Meaning
PerEUR	Units of the currency for 1 EUR, as published. On 14 October 2026: 1 EUR = 24.357 CZK.
EURPerUnit	EUR for 1 unit of the currency. Multiply a foreign amount by this to get EUR.
RateDate	The publication day; weekends and TARGET holidays carry the last rate.

Convert CZK actuals to EUR at the monthly average rate

```
let
    FX = ECB_FX(#date(2026,1,1), #date(2026,12,31), {"CZK"}, false),
    ByMonth = Table.Group(
        Table.AddColumn(FX, "YearMonth", each Date.ToText([Date], [Format = "yyyy-MM"]), type text),
        {"YearMonth"}, {"AvgEURPerCZK", each List.Average([EURPerUnit]), type number})
in
    ByMonth
```

Merge this on YearMonth with your actuals and multiply. Averaging published days only (`FillCalendarDays = false`) matches how most groups define a monthly average rate.

Edge cases

Input	Result
Empty list <code>{}</code>	Empty table with all five columns, no request sent
A code the ECB doesn't publish, e.g. <code>{"XYZ"}</code>	No rows for it; listed in <code>Value.Metadata(Result)[MissingCurrencies]</code>
Not a 3-letter code, e.g. <code>{"EURO"}</code>	Error naming the code
EndDate before StartDate, or StartDate in the future	Error with both dates
EndDate in the future	Rates up to today; no rate is carried into the future
A range with no publication (e.g. a weekend with <code>FillCalendarDays = false</code>)	Empty table with all columns

Credentials: `data-api.ecb.europa.eu` → **Anonymous**. Designed to refresh in the Power BI Service without a gateway; not yet tested there. The request contains only the dates and currency codes.

Folder_Combine: a folder that survives layout changes

Power Query's built-in *Combine files* builds the column list from one sample file. When next month's export has an extra column, the column is silently missing; when a column is renamed or removed, the refresh fails. Folder_Combine reads every file on its own and matches columns by name, so all columns from all files survive.

```
Folder_Combine("C:\Exports")
Folder_Combine("C:\Exports", [NameStartsWith = "KSB1_", Transform = each SAP_CleanList(_, [Encoding = 1250])])
Folder_Combine(SharePoint.Files("https://contoso.sharepoint.com/sites/Finance", [ApiVersion = 15]),
  [FolderContains = "/Exports/2026/", Extension = ".xlsx", Sheet = "Data"])
```

Option	Use it to
Extension	Pick file types: ".csv" or a list {".csv", ".txt"}. Default: csv, xlsx, xlsxm, txt.
NameStartsWith, NameContains	Pick files by name, e.g. only KSB1_
FolderContains	Pick a subfolder of a SharePoint library
Sheet	Sheet or table name in Excel files (default: first sheet)
Delimiter, Encoding	CSV details; the delimiter is detected from the header line if you leave it out
Transform	Your own reader, e.g. each SAP_CleanList(_) for SAP list exports
NormalizeHeaders	Default on: trims spaces in headers and matches Amount and amount as one column
OnError	"skip" to skip files that can't be read instead of failing the refresh

Every row gets **SourceFile**, **SourceFolder** and **SourceModified**, so you can trace a number back to its file. Excel lock files (~\$...), SAP_Export temporary files (~sapexp_...) and backups (names containing .bak_ or ending in .bak) are never read; their names are listed in Value.Metadata(Result)[ExcludedFiles].

Skipped files. With OnError = "skip" the names of skipped files are attached to the result: Value.Metadata(Result)[SkippedFiles]. Show that list on a check sheet so a broken file doesn't go unnoticed.

SAP_UnpivotPeriods: period columns into rows

Drilldown reports such as S_ALR_87013611, KE30 or Report Painter reports, and most budget files, put each period in its own column. Pivot tables, Power BI and any year-over-year logic need one row per period. SAP_UnpivotPeriods recognises period columns by their header and turns them into rows.

```
let
    Cleaned = SAP_CleanList(File.Contents("C:\Exports\S_ALR_87013611.txt")),
    Periods = SAP_UnpivotPeriods(Cleaned)
in
    Periods
```

Header examples	Recognised as
001/2026 , 12/2026 , 01.2026	Period and year
2026/001 , 2026-01 , 202601	Year and period
Period 1 , Per. 01 , P01 , Období 3	Period only: add [Year = 2026]
Jan , January 2026 , Jänner , Leden , Říjen , Styczeń	Month name in EN, DE, CS, SK or PL, with or without a year

Numbers stored as text

Values that are already numbers are used as they are. Text values are converted only with an explicit culture, so 1.234 is never guessed:

```
SAP_UnpivotPeriods(Cleaned, [Culture = "de-DE"]) // 1.234,50 and 1.234,50- (trailing minus)
SAP_UnpivotPeriods(Cleaned, [Culture = "en-US"]) // 1,234.50 and (1,234.50)
```

A cell that still can't be read stops the query with its column, row and original text. With [OnInvalid = "keep"] such rows stay in the result with an empty Value and the original text in an extra column **ValueText**, so nothing disappears silently.

Columns named *Total*, *Sum*, *Celkem*, *Summe*, *Gesamt*, *Spolu*, *Razem*, *Összesen* are dropped (switch off with [DropTotals = false]). Rows with zero or empty values are dropped unless you set [KeepZeros = true].

Output columns: all your other columns, then **Year**, **Period** (1–16), **Date** (first day of the month; special periods 13–16 get December) and **Value**.

If the function stops with *Some period columns have no year*, the headers carry only a period or month name. Add [Year = 2026]. If it stops with *No period columns found*, the message lists the column names it saw; rename them or tell us the format.

VIES_Check: EU VAT numbers

An intra-EU supply invoiced without VAT needs a customer VAT number that is valid on the invoice date. VIES_Check asks the European Commission's VIES service and returns validity, the registered name and address, and the time of the answer, which is worth keeping as evidence.

```
VIES_Check("CZ00177041")
VIES_Check("DE 811 907 980")      // spaces, dots and dashes are removed
VIES_Check("00177041", "CZ")      // country given separately
```

Check a whole list

```
let
    Customers = Excel.CurrentWorkbook()[{Name = "Customers"}][Content],
    Checked    = Table.AddColumn(Customers, "VIES", each VIES_Check([VAT number])),
    Result     = Table.ExpandRecordColumn(Checked, "VIES", {"IsValid", "Status", "Name", "Address", "CheckedAt", "Error"})
in
    Result
```

IsValid is `true` or `false` only when VIES answered. It is empty when there was no answer (service down, timeout, wrong input): never read empty as invalid. **Status** says which case it is.

Status	Meaning
VALID / INVALID	VIES answered; IsValid is true / false
MS_UNAVAILABLE	That country's database is down for now; refresh later
SERVICE_UNAVAILABLE	VIES itself didn't answer (network, timeout, server error); ErrorDetail has the technical message
TIMEOUT, MS_MAX_CONCURRENT_REQ	Too many requests; check fewer numbers per refresh
INVALID_INPUT	Characters other than letters and digits, or VIES rejected the format
PREFIX_MISMATCH	The number starts with one country but CountryCode says another, e.g. <code>VIES_Check("CZ00177041", "SK")</code>
NO_COUNTRY_CODE, NOT_EU_COUNTRY, EMPTY	No prefix and no country; a prefix that isn't an EU member state (use EL for Greece; GR is converted); no number

VIES limits heavy use. Keep a refresh to a few hundred numbers. Some countries return the name and address as ---; the function returns empty values then. A *Formula.Firewall* error here is the privacy check doing its job: every VAT number in your table is sent to ec.europa.eu. Decide under your company policy whether those numbers may go to VIES before you change anything. Keep each source at the level its sensitivity requires; never switch the checks off or reclassify private data just to make the refresh pass. If you are unsure, ask your administrator or data-protection contact.

What leaves your computer: each VAT number you check is sent over HTTPS to the European Commission's VIES service (ec.europa.eu), which asks the national tax database. Nothing is sent to Controller's Kit.

Calendar_Workdays 1.1.2: Poland, Hungary, Austria

Version 1.1 adds three countries; 1.1.2 makes the workday counters independent of the date range. One row per day with Year, Month, ISO week, fiscal period, IsHoliday, HolidayName, IsWorkday, **WorkdayOfMonth** and **WorkdaysInMonth** (the Starter Guide, included with this tool, lists all columns).

Counters always use the whole month. When the range starts or ends mid-month, WorkdayOfMonth and WorkdaysInMonth still count from the 1st to the last day of that month: `Calendar_Workdays(#date(2026,10,15), #date(2026,10,31))` returns 15 October as workday 11 of 21. Versions before 1.1.2 counted only inside the range.

```
Calendar_Workdays(#date(2026,1,1), #date(2026,12,31), "PL")
Calendar_Workdays(#date(2026,1,1), #date(2026,12,31), "HU")
Calendar_Workdays(#date(2026,1,1), #date(2026,12,31), "AT")
```

Country	What's included	Workdays 2026
PL	All statutory days off, including Corpus Christi and, since 2025, Christmas Eve	253
HU	Public holidays including Good Friday, plus the 2026 bridge days (2 Jan, 21 Aug, 24 Dec) as days off and the Saturdays worked in exchange (10 Jan, 8 Aug, 12 Dec) as workdays	253
AT	Statutory holidays; no Good Friday (abolished 2019), no Christmas Eve	251

Things to know

- **Poland:** labour law reduces working time for a holiday that falls on a Saturday (15 August and 26 December 2026). The employer chooses the replacement day, so it isn't a fixed date and the calendar can't know it; Polish payroll counts 251 working days for 2026 for that reason. Add your company's replacement days to `ExtraHolidays`.
- **Hungary:** bridge days are set each year by government decree. They sit in the `HungaryShiftedDays` list near the top of the file; library updates add each new year. You can add them yourself in the same form: `{#date(2027, 1, 2), "rest"}` or `{#date(2027, 1, 9), "work"}`.
- **Austria:** only nationwide holidays. Regional ones (e.g. 19 March in Carinthia) go into `ExtraHolidays`.

Open Items Aging (AR / AP)

`OpenItems_Aging.xlsx` ages open customer items (FBL5N) or vendor items (FBL1N) at a key date, revalues foreign-currency items at the key-date rate and ranks partners by overdue amount. The sample file `FBL5N_sample.txt` contains the same 34 items as the workbook, so you can try the query on the Queries sheet.

Sheets

Sheet	What it does
Settings	Key date, bucket limits (default 30 / 60 / 90 days; the labels follow the limits) and exchange rates at the key date, each with a check. The sample uses the ČNB fixing of 30 September 2026.
OpenItems	One row per open item. Columns A–I are your data; J–P compute days overdue, bucket, key-date rate, revalued amount, FX difference, a Row check and a duplicate hint. Formulas are ready down to row 2000.
Aging	Items and amounts per bucket, overdue share, overdue above 60 days, a status line and seven checks
Partners	Each partner by bucket with a rank, and the top 10 overdue with the part older than 60 days
Queries	Power Query code to load FBL5N or FBL1N through SAP_CleanList, and the CNB_FX call for key-date rates

Loading the query. Do not follow step 4 on the Queries sheet (loading onto OpenItems): loading a query onto a sheet that already has headers and formulas makes Excel insert columns. This was reproduced in the Budget vs. Actual workbook; here it is untested. Load to a new worksheet, clear OpenItems!A5:I2000 (contents only), paste the data rows as values into OpenItems!A5 and check that Aging!E10 equals the imported booked total. `START_HERE.md` has the step-by-step version with a check formula. This path passed natively in Excel on the FBL5N sample (19 Oct 2026); the check formula, not the Aging status, caught a deliberately dropped item.

Sample result

Of 6.53 million CZK open at 30 September 2026, 50.0% is overdue and 0.31 million CZK is older than 60 days. Revaluation at the key-date rate adds 24,907 CZK against the amounts booked at invoice-date rates.

Missing or wrong input is never counted as zero

- A row without partner, due date, currency, amount or booked amount, with text instead of a number or date, or in a currency without a valid rate, shows the reason in **Row check** (column O) and `#N/A` in the calculated columns. It is left out of the totals and the Aging status says **RESULT INCOMPLETE** until it is fixed.
- Exchange rates must be numbers above zero, each currency listed once; the company currency always uses rate 1.
- Bucket limits must be whole days in ascending order.
- Partners must be listed once on the Partners sheet and cover all partners with open items.
- An amount of 0 and negative amounts (credit notes) are valid.

Days overdue count from the net due date to the key date. Items due on the key date or later are *Not due*. Credit notes age like invoices; if your policy is to offset them, filter them before loading.

Time Intelligence calculation group

One calculation group gives your measures twelve time calculations, without writing twelve versions of each measure. Put *Time Calculation* on the columns of a matrix, or in a slicer, and the measure switches between them. It is built for **additive measures** such as amounts, quantities and counts. For ratios, averages or distinct counts, check each item before you rely on it: a period total of a ratio is not the ratio of the period.

Item	Calculation
Current	The measure as it is
MTD, QTD, YTD	Month, quarter and year to date
Fiscal YTD	Year to date with a fiscal year ending 31 March; change "3/31" to your year end
PY, PY YTD	Same period and same YTD of the prior year
YoY, YoY %	Change against the prior year; blank when either year is missing
YTD vs PY YTD %	Year-to-date growth
Rolling 12M	Total of the last 12 months up to the selected date
Rolling 3M avg	Average of the monthly values of the last three months up to the end of the selected month; months without data are not counted

Install

1. Your model needs a date table named *Calendar* with a column *Date* that covers whole years, related to your facts. *Calendar_Workdays* is exactly that. If yours has another name, open `TimeIntelligence_TMDLview.tmdl` in Notepad and replace `'Calendar' [Date]` first.
2. Power BI Desktop: **TMDL view** (left bar) → + for a new script tab → paste the whole file → **Apply**.
3. If Power BI asks to turn off implicit measures, accept: calculation groups require it, and you then build visuals from measures only.

The percentage items carry their own format (0.0%), so a currency measure shows as a percentage only on those items.