

FINTACTIX · FINANCIAL CALCULATORS

Rate Engine Implementation Guide

Keeping your calculators' starting rates current — on your schedule, from your server.

Version 1.0 · April 2026

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Support: info@fintactix.com

Documentation Library: <https://www.fintactix.com/documentation>

1. What the Rate Engine Does

Most Fintactix calculators include a rate field — the interest rate on an auto loan, the APR on a mortgage, the APY on a certificate of deposit, and so on. Without the Rate Engine, these fields open at a fixed default value. The Rate Engine replaces that static default with a current rate on every page load, so the moment a consumer opens one of your calculators the rate is already set to whatever you want to show.

The engine runs on the Fintactix calculators platform. On every cron cycle it fetches a JSON file of current rates, merges it with Fintactix's default file if needed, stores the result locally, and injects the values into the calculator page through `drupalSettings`. Per-calculator JavaScript then reads those values and pre-populates the relevant rate fields — including syncing the slider position — before the consumer sees the page.

Two hosting models

The engine accepts two kinds of source URL for each rate category, and the choice is per category — you can mix them freely.

- **Fintactix-hosted defaults** — your category points at `https://rates.fintactix.com/rates-{category}.json`. Fintactix maintains these files; the engine picks up updates automatically. No action required on your side.
- **Customer-hosted JSON** — your category points at a JSON file on *your* server or CDN (for example, `https://yourbank.com/rates/mortgage.json`). You own the file, you update it when your rates change, and the engine picks up the new values on the next scheduled fetch.

Customer-hosted files can be complete (every program and term your calculators use) or partial (only the programs you care about). Partial files are automatically merged with the Fintactix default file for that category — your keys win; Fintactix fills whatever you left out. This is covered in detail in Section 4.

Important — configuration is managed by Fintactix

Customers don't have platform admin access

The Rate Engine is configured through the Drupal administration UI on the Fintactix calculators platform, which Fintactix customers do not have direct access to. Your Fintactix contact configures the source URLs, fetch interval, and per-category enablement on your behalf.

Your responsibilities, if you choose to host rates yourself, are: (1) produce a JSON file in the schema documented in Section 4, (2) host it at a publicly reachable HTTPS URL, (3) send that URL to Fintactix during onboarding, and (4) keep the file up to date when your rates change. The platform handles everything from the fetch onward.

2. Supported Categories and Program Keys

The engine supports six rate categories. Each category maps to one or more program keys — the identifiers used inside the JSON file and inside the calculator JavaScript to locate a specific rate. When you produce a customer-hosted JSON file, the category determines the file's role; the program keys inside determine which calculator fields get populated.

Category	Program Keys	Where the Rate Appears (Calculator IDs)
mortgage	mortgage_fixed mortgage_arm	m00, m01, m02, m03, m04, m05, m06 (ARM), m07, m09, m11, m12
auto	auto_loan	a00, a01, a02, a03, a04, a05, a07
home_equity	home_equity_loan heloc	e02, e03, e04, e05, e06, e07
savings	savings_account cd	s02, s08, s09
debt	personal_loan balance_transfer	d01, d06
business_finance	business_loan business_loc equipment_loan	fin01, fin02, fin06, fin07

Some calculators in these series do not take rate injection — for example, Savings Rate Comparison (s01) is a planner, Closing Costs (m08) has no rate field, and several debt-series tools work with existing-loan rates that the consumer supplies. These calculators are unaffected by the Rate Engine and continue to function normally.

Term-based vs. rate-only program keys

Most rate fields are term-sensitive: a 30-year fixed mortgage gets a different rate from a 15-year fixed. The engine resolves this by reading a sibling term field on the calculator,

converting to months, and looking up the matching entry in your JSON. If the consumer changes the term slider, the rate is re-injected.

A smaller set of fields are rate-only — HELOCs, savings accounts, business lines of credit, and balance transfers. These program keys carry a single rate with no term variation, and in the JSON they use "term_months": null alongside a term_label such as "Variable" or "Current APY".

Nearest-term fallback

If a consumer's term doesn't exactly match a term in your JSON — say they set 20 years on a mortgage calculator but your file only has 15 and 30 — the engine automatically falls back to the nearest available term. You don't need to enumerate every possible term; a reasonable set of common terms per program key is sufficient.

3. Deciding How to Use the Engine

Before Fintactix configures the engine for your site, decide the following for each of the six categories.

Decision 1 — Which categories to enable

Any category with an empty source URL is skipped by the engine — its calculators use their static defaults. You can leave categories you don't care about empty, or have Fintactix point them at the Fintactix-hosted defaults so the values at least reflect national averages. Categories can be enabled or disabled at any time by contacting Fintactix.

Decision 2 — Fintactix defaults or your own file, per category

For each enabled category, decide which URL Fintactix should configure:

Source Type	What You Provide	Best For
Fintactix defaults	Nothing. Fintactix points the category at rates.fintactix.com.	Categories where you don't actively advertise a rate, or where a market-average starting point is acceptable.

Source Type	What You Provide	Best For
Your own complete file	A JSON file with every program and term you want to control. Hosted on your server or CDN.	Categories where you actively advertise rates — mortgage, auto, savings specials, featured HELOC.
Your own partial file	A JSON file with only the programs you want to override. The engine merges it with the Fintactix default for that category.	When you want to feature one or two products (for example, a CD special) but let Fintactix defaults cover the rest of the category.

Partial files are the most common choice for institutions that market a few specific products. If you publish only a cd program with your 12-month and 24-month CD specials, the engine still fills in `savings_account` from the Fintactix default so any savings calculator on your site still gets a reasonable APY.

Decision 3 — Who owns the file on your side

If you are hosting your own JSON, name a primary and backup rate owner. These are the people authorized to request URL changes or confirm rate updates with Fintactix, and typically the same people who own rate sheets on your main website.

- Primary rate owner — name, role, email, phone.
- Backup rate owner — name, role, email, phone.

4. JSON File Schema

Customer-hosted rate files must follow the same schema as the Fintactix default files. This section documents the schema. Files that don't conform — missing the `programs` key, invalid JSON — cause the fetch to fail and the engine keeps using the last successfully stored values.

Top-level structure

```
{
  "effective_date": "2026-04-22",
  "source": "First National Credit Union",
  "programs": {
    "<program_key>": [
      { "term_months": <int>, "term_label": "<string>", "rate": <float> },
      ...
    ],
  },
}
```

```

    ...
  }
}

```

Top-level keys:

Key	Required	Purpose
programs	Yes	Object mapping program keys to arrays of rate entries. An empty programs object causes the fetch to fail validation.
effective_date	No	Date the rates in this file took effect, in YYYY-MM-DD format. Displayed on the platform's admin status table; not shown to consumers.
source	No	Free-text attribution string. Stored alongside each rate. Useful for audit trails — typically your institution name.

Rate entry fields

Each entry inside a program key's array describes one specific rate — typically one term.

Key	Required	Purpose
rate	Yes*	Numeric rate value as a percentage. 6.75 means 6.75%, not 0.0675. APR for loan products, APY for savings products. *Not required for balance_transfer entries — see below.
term_months	Yes	Term in months. Use an integer for term-sensitive program keys (mortgage, auto, home equity loan, CD). Use null for rate-only program keys (HELOC, savings account, business LOC, balance transfer). The key itself must always be present.
term_label	Recommended	Human-readable label for the term, e.g. "30-Year Fixed" or "Variable". Standard practice in all Fintactix files. Displayed in the platform's admin status table; not shown to consumers.
notes	No	Free-text notes for internal use. Ignored by the engine.

Example — a complete customer mortgage file

```

{
  "effective_date": "2026-04-22",
  "source": "First National Credit Union",
  "programs": {
    "mortgage_fixed": [
      { "term_months": 360, "term_label": "30-Year Fixed", "rate": 6.75 },
      { "term_months": 240, "term_label": "20-Year Fixed", "rate": 6.50 },
      { "term_months": 180, "term_label": "15-Year Fixed", "rate": 6.00 },
      { "term_months": 120, "term_label": "10-Year Fixed", "rate": 5.88 }
    ],
    "mortgage_arm": [
      { "term_months": 360, "term_label": "5/1 ARM", "rate": 6.25 },
      { "term_months": 360, "term_label": "7/1 ARM", "rate": 6.38 },
      { "term_months": 360, "term_label": "10/1 ARM", "rate": 6.50 }
    ]
  }
}

```

Example — a partial savings file (merge behavior)

This file controls only the 12-month and 24-month CD specials. Everything else in the savings category — the savings account APY, other CD terms — falls back to the Fintactix default file, merged automatically.

```

{
  "effective_date": "2026-04-22",
  "source": "First National Credit Union - Q2 CD Specials",
  "programs": {
    "cd": [
      { "term_months": 12, "term_label": "12-Month Special", "rate": 4.75 },
      { "term_months": 24, "term_label": "24-Month Special", "rate": 4.50 }
    ]
  }
}

```

Special case — balance transfer entries

The `balance_transfer` program key (used by the d06 Balance Transfer Calculator) carries more than one value per entry: an intro rate, a standard rate, a transfer fee, and an intro period in months. Fields beyond the standard set above are preserved automatically and made available to the calculator. This is the only program key that uses this expanded form.

```

"balance_transfer": [
  {
    "term_months": null,
    "term_label": "Balance Transfer Offer",
    "intro_rate": 0.00,
    "standard_rate": 21.39,
    "transfer_fee_pct": 3.00,
  }
]

```

```
    "intro_period_months": 12
  }
]
```

Note that `balance_transfer` is the only program key where a top-level rate field is not required — `intro_rate` alone is sufficient to make the entry valid.

Validation checklist

Before sending a URL to Fintactix, confirm your file:

- Is served over HTTPS from a publicly reachable URL (no IP allowlists, no authentication).
- Returns a Content-Type of `application/json`.
- Has a top-level `programs` object. Files without this key fail validation.
- Uses only the program keys listed in Section 2. Unknown program keys are ignored silently, which is a common source of "my rates aren't showing up" confusion.
- Expresses rates as percentages, not decimals. 6.75, not 0.0675.
- Sets `term_months` to null for rate-only program keys (`heloc`, `savings_account`, `business_loc`, `balance_transfer`) and to the correct integer month count for term-sensitive ones.
- Parses as valid JSON (no trailing commas, no comments — standard JSON only).

5. Merge Behavior with Fintactix Defaults

When Fintactix configures a category to use your URL instead of the Fintactix default, the engine still fetches the Fintactix default file and merges it with yours. This protects you from accidentally shipping partial coverage and having calculators silently fall back to hard-coded defaults.

The merge rule

- Merging happens at the program-key level, not at the individual entry level.
- If a program key exists in your file, your entire program array replaces the Fintactix one for that key.
- If a program key is missing from your file, the Fintactix default programs array for that key is used in full.

In other words: you don't have to provide everything, but when you do provide a program key, provide every term you care about. A partial program array will not get padded out with Fintactix entries for the missing terms.

Worked example

Suppose you host a savings file containing only a cd program key with 12-month and 24-month specials. The Fintactix default savings file contains both a cd program (with 6, 12, 24, 36, 60 month entries) and a savings_account program (with a single APY). After merge:

Program Key	After Merge	Source
cd	12mo and 24mo only (your file, in full)	Yours
savings_account	Single APY entry (Fintactix default)	Fintactix

A consumer using a CD Calculator and sliding the term to 36 months will trigger the engine's nearest-term fallback, which selects the nearest term inside your cd array — in this case 24 months. It does *not* fall back to the Fintactix 36-month entry, because once you supplied the cd program key your entries for that key are authoritative.

If the Fintactix default file is unreachable

If the merge fetch fails for any reason (network error, CDN downtime), the engine logs a warning and proceeds with your file alone. Your calculators stay functional on your data; Fintactix's support team is alerted via platform logs. This fail-open behavior is deliberate — a transient merge failure should never knock your rates offline.

6. The Fetch Lifecycle

This section describes what happens from the moment you update your JSON file to the moment a consumer sees the new rate.

1. Your team updates the hosted JSON file and republishes it to your server or CDN. No notification to Fintactix is required — the engine will pick up the new file on its next scheduled fetch.

2. On the next Drupal cron invocation on the calculators platform (every platform cron cycle — typically hourly), the engine's cron hook iterates through every enabled category.
3. For each category, the engine consults a staleness check. If the last successful fetch for that category is newer than the configured fetch interval (default 24 hours, configurable by Fintactix), the fetch is skipped. Otherwise the engine makes an HTTPS GET request to your URL with a 10-second timeout.
4. If the fetch succeeds and the JSON validates, the engine performs the merge with the Fintactix default file (described in Section 5), then upserts each entry into its local rate table. Existing entries are updated in place; new entries are inserted.
5. On the next page load of any calculator on your site, the stored rates are passed to the browser via drupalSettings. The per-calculator JavaScript sets the rate field to the new value and syncs the slider position. The consumer sees the new rate as the starting value.

Expected time for a rate update to appear

From the moment you publish your new JSON to the moment a consumer sees the updated rate:

Step	Typical Duration	Upper Bound
Your CDN / origin publish delay	Immediate to a few minutes	Depends on your infrastructure
Engine cron picks up the new file	Within the fetch interval	24 hours (at the default setting)
Consumer sees new starting rate	On the next page load after step 2	Next page load

Most customers see end-to-end turnaround of under an hour when the fetch interval is short, and under a day at the default interval. For time-sensitive promotions (launching a rate special at a specific moment), coordinate with Fintactix in advance — they can reduce the fetch interval for that category, or trigger an on-demand fetch from the admin UI to force an immediate pickup.

What the consumer does not see

- They do not see the rate change mid-session. Values are set at page-load time and stay fixed for that session.
- They are not prevented from changing the rate. If they type a different rate or slide the slider, their value is used for the rest of that session.

- They do not see effective dates or source attributions. Those fields are for Fintactix's internal audit; consumers see the rate value only.

7. What to Send Fintactix

To enable or change Rate Engine configuration on your site, send Fintactix (info@fintactix.com) the following. Only nominated rate owners (Section 3, Decision 3) are authorized to request changes.

Item	Details
Institution name	Full legal name as recorded with Fintactix.
Rate owners	Name, role, email, and phone for the primary and backup rate owners.
Per-category source decisions	For each of mortgage, auto, home_equity, savings, debt, business_finance: either "use Fintactix default", "disable", or "use our URL: <url>".
JSON file URLs	The public HTTPS URL for each category where you're hosting your own file.
Fetch interval preference	If you want faster or slower than the 24-hour default. Common alternatives: 1 hour for rapidly changing mortgage rates, 4 hours for general use, 168 hours (weekly) for stable categories.
Go-live date	Target date for the engine to start serving your rates. Allow Fintactix 1–2 business days after all items are received.

On the Fintactix side

Fintactix's configuration steps, for context:

- Sign in to the calculators platform admin UI at /admin/config/fintactix/rate-engine.
- Paste each category's URL into the corresponding source field (or clear it to disable).
- Set the fetch interval.
- Click Save and fetch now — the engine immediately fetches from each URL, bypassing the staleness check, and stores the results. The admin's "Current Stored Rates" table confirms what was stored.
- Fintactix confirms the go-live to your rate owners and sends a spot-check URL for one calculator in each affected category.

Ongoing changes

- Changing rate values: update your hosted JSON file. No email required — the engine picks up the change on the next cron cycle.
- Changing source URL: email Fintactix with the new URL and category.
- Enabling or disabling a category: email Fintactix.
- Changing fetch interval: email Fintactix.
- Changing rate owners: email Fintactix from an existing rate owner's address, copying the new owner.

8. Troubleshooting

If your updated rates aren't showing up on a calculator, the quickest way to diagnose is to work backward through the lifecycle in Section 6. Below are the common causes, in order of frequency.

Symptom	What to Check
New rates in your file aren't appearing on any calculator yet.	The engine only fetches every N hours (default 24). If the last fetch was recent, the new file won't be pulled until the interval elapses. Ask Fintactix to trigger a Save and fetch now from the admin UI to force immediate pickup.
Some rates appear; others don't.	Program-key mismatch. Confirm the program keys in your JSON exactly match those in Section 2. A common error is "mortgage" instead of "mortgage_fixed" or "auto" instead of "auto_loan". Unknown keys are ignored silently.
Rate shows but is wildly off — 100x too large or too small.	Rate is probably expressed as a decimal (0.0675) instead of a percentage (6.75). Correct the file; the next cron cycle will overwrite the stored values.
Rate field shows but term-specific value looks wrong.	Check the term_months field. 30-year mortgage is 360, 15-year is 180, 5-year CD is 60. The engine uses the calculator's current term to look up the right entry; a mismatched term_months sends the wrong rate.
Entire category shows defaults, not your rates.	The fetch is failing. Ask Fintactix to check platform logs (watchdog:show --type=fintactix_rate_engine). Usual causes: URL not publicly reachable, non-JSON response, missing programs key, HTTPS certificate error, file exceeds the 10-second timeout.

Symptom	What to Check
Balance transfer calculator (d06) shows rates but not fees or intro period.	The balance_transfer entry is missing the expanded fields (intro_rate, standard_rate, transfer_fee_pct, intro_period_months). See Section 4.
Rate looks correct on page load but resets when consumer changes the term slider.	This is expected behavior. The engine re-injects the rate when the term changes, using the new term's entry from your file. If the new rate is unexpected, check the term_months entries in your JSON.

How to verify a fetch

Ask your Fintactix contact to:

- Open /admin/config/fintactix/rate-engine and expand the "Current Stored Rates" table.
- Filter to your category and confirm the Last Fetched timestamp is recent and the rates match your file.
- If the timestamp is stale, click Save and fetch now to force an immediate pull.
- If a fetch error appears, the admin UI surfaces the error message (missing programs key, HTTP failure, JSON parse error).

9. Quick Reference

Fintactix default URLs

Category	Default URL
mortgage	https://rates.fintactix.com/rates-mortgage.json
auto	https://rates.fintactix.com/rates-auto.json
home_equity	https://rates.fintactix.com/rates-home-equity.json
savings	https://rates.fintactix.com/rates-savings.json
debt	https://rates.fintactix.com/rates-debt.json
business_finance	https://rates.fintactix.com/rates-business-finance.json

Common term values

Product / Term	term_months value
30-year mortgage	360
20-year mortgage	240
15-year mortgage	180
10-year mortgage / 10-year home equity	120
Auto loan — 72 months	72
Auto loan — 60 months	60
Auto loan — 48 months	48
CD / certificate — 12 / 24 / 36 / 60 months	12, 24, 36, 60
HELOC, savings account, business LOC, balance transfer (rate-only)	null

Hosting checklist

- Public HTTPS URL (no basic auth, no IP allowlist).
- Content-Type: application/json.
- Valid JSON with top-level programs object.
- Program keys match Section 2 exactly.
- Rates as percentages (6.75), not decimals (0.0675).
- term_months set to null for rate-only program keys; correct month counts for term-sensitive ones.
- File size well under 1 MB (Fintactix default files are 1–5 KB for reference).

Where to send questions

Email info@fintactix.com. Your account representative is the fastest path for any Rate Engine configuration or support question.

— End of Guide —