MCP SERVER | NO CODE | CLOUD HOSTED

Sample Offset Calculator MCP for AI Agents

Achieve perfect rhythmic and phase alignment in your Digital Audio Workstation tracks.

The Sample Offset Calculator is a specialized MCP for digital audio engineers. It solves timing problems by converting milliseconds into exact, discrete audio samples and vice versa. Use it to ensure perfect phase and rhythmic alignment in your Digital Audio Workstation (DAW), regardless of the sample rate you're running.

A+ Quality Score 100/100

audio | samples | milliseconds | daw | precision | conversion

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vinkius.com/mcp/sample-offset-calculator

SCAN TO VIEW

The connectivity layer between AI and the world's software.

Vinkius sits between AI and every application. All communication passes through Vinkius Cloud via the Model Context Protocol (MCP) — with governance, observability, and security at every layer.

Your AI Connections Run Through Vinkius Cloud

The world's largest managed MCP catalog

Vinkius is the connectivity layer where AI connects to the software your business already runs. We handle the hosting, the security, the credentials, the uptime — you get agents that actually do things.

We operate the world's largest managed MCP catalog. Major SaaS platforms, CRMs, databases, and cloud providers — running, monitored, production-ready. This MCP server is hosted and maintained by the Vinkius Cloud for AI Agents.

> *The agent doesn't manage credentials, doesn't manage uptime, doesn't manage security. Vinkius does.*
>
> — Architecture principle

Four Pillars of the Vinkius Runtime

01 — Security by design

Credentials stay encrypted at rest via AES-256. The AI agent never touches raw keys — they're injected into a sandboxed V8 isolate at runtime. Actions are logged, and connections have an emergency kill switch.

02 — Built on MCP Fusion

This MCP server was built with **MCP Fusion**, the open-source framework (Apache 2.0) that powers the entire Vinkius catalog. Schema-as-firewall strips undeclared fields, compiled PII redaction runs at zero overhead, and cryptographic lockfiles produce git-diffable audit trails.

03 — Deterministic observability

Eight immutable metrics per endpoint: request volume, p95 latency, error rate, active connections, cost attribution. A live payload feed logs every tool call with mutation detection.

04 — Autonomous operations

Servers are deployed, monitored, and patched autonomously. New capabilities and security patches ship weekly. Zero-downtime deployments ensure continuous availability across all managed MCP servers.

AES-256	Ed25519	24h TTL	V8 Isolate
Encryption at rest	PKI vault signatures	Ephemeral session keys	Sandboxed execution

One Token. Instant Access.

Every MCP server on Vinkius is accessed through a **Connection Token**. Tokens are generated in the cloud dashboard and produce a unique MCP endpoint URL. Paste this URL into any MCP-compatible client — no SDK required.

A single token can serve **multiple AI clients simultaneously**, or you can issue separate tokens per client for granular access control. Each token tracks its own request count, last activity timestamp, and can be individually enabled or revoked.

MCP ENDPOINT

```
https://edge.vinkius.com/{token}/mcp
```

Claude · Cursor · VS Code · Windsurf · Grok · Gemini

Security Is the Architecture

Security in Vinkius is not a feature — it's the foundation of the runtime. The gateway enforces multiple independent protection layers between AI agents and third-party APIs.

01 — Ed25519 PKI Vault

Every workspace has an Ed25519 Master Key. Session keys are generated ephemerally (24h TTL) and signed by the Master Key. Credentials never leave the vault boundary.

02 — V8 Isolate Sandboxing

Tool code runs inside isolated-vm V8 isolates with 64 MB memory caps and per-request timeouts. No filesystem access, no network access except through the SSRF-guarded fetch bridge.

03 — SSRF Guard

All outbound HTTP requests are DNS-resolved and validated before execution. Private IP ranges (10.x, 172.16-31.x, 192.168.x, AWS metadata 169.254.x) are blocked at the network layer.

04 — DLP & PII Redaction

A ResponseGuard pipeline intercepts every tool response. Configurable redaction patterns strip sensitive fields (emails, SSNs, card numbers) before data reaches the AI agent.

05 — Cryptographic Audit Trail

Every request is signed into a SHA-256 hash chain with Ed25519 signatures. Events form a tamper-proof, SIEM-exportable forensic record.

06 — Honeytoken Trap System

Phantom credentials are injected into isolated environments. If a honeytoken is used outside Vinkius infrastructure, the server is quarantined instantly.

Emergency Kill Switch

EU AI Act Art. 14(1) Compliant

The kill switch is an **emergency halt** mechanism — not a simple toggle. When triggered, it executes three actions atomically:

01 — Server deactivated

The MCP server is immediately taken offline across the entire cluster.

02 — All tokens revoked

Every connection token is invalidated. Total lockout — reconnection blocked until new tokens are issued.

03 — WebSocket connections killed

Active connections terminated via Redis pubsub broadcast. Propagates to every runtime node in the cluster.

Full Visibility. Zero Guesswork.

The Vinkius cloud dashboard includes a full MCP Governance suite — real-time analytics and security controls for production AI operations.

Control Plane

KPI dashboard with request volume, latency, success rate, token consumption, and AI-generated operational briefings.

Agent Activity

Which AI clients are connecting, how often, and what they're doing — real-time session tracking.

FinOps

Cost tracking per tool, payload compression savings, budget optimization signals, and consumption trends.

Tool Health

Slowest and most error-prone tools, with actionable root-cause insights and performance baselines.

Firewall & DLP

PII redaction activity, sensitive data protection counters, and security event timeline.

Incident Log

Error trends, failure rates, status-code breakdowns, and forensic audit trail access.

> Get started at **cloud.vinkius.com** — connect your AI agent in under 60 seconds.

Sample Offset Calculator MCP

3 tools available
Cloud-hosted on Vinkius

Working with audio often means dealing with impossibly precise timings. You need to know exactly how many digital samples represent a fraction of a millisecond, or vice versa, especially when mixing complex tracks. This MCP gives your AI agent that precision. It allows you to move beyond rough estimates and calculate the exact sample count needed for perfect DAW alignment. Whether you're working with 44.1kHz, 48kHz, or 96kHz material, this tool ensures your timing remains rock solid, preventing frustrating drift in your mix. You connect everything through Vinkius, giving your agent access to thousands of specialized tools across every industry—it’s a huge advantage for any creative professional. Instead of doing tedious math in spreadsheets, you just tell your agent what conversion you need and get the precise sample count back immediately.

Core Capabilities

01 — Convert time units

Your AI client converts milliseconds into an exact number of audio samples.

02 — Calculate duration in milliseconds

Your AI client takes a raw sample count and returns the equivalent duration in milliseconds.

03 — Check timing accuracy

Your AI client verifies if a specific sample count falls perfectly on a millisecond boundary, identifying any potential drift.

One Click on Vinkius — From Prompt to Execution

Available at **vinkius.com/mcp/sample-offset-calculator** — connect your AI agent in three steps.

01 Tell your agent the conversion you need and provide the necessary parameters, like the total duration in milliseconds or the raw sample count.

02 The MCP processes the request using its internal algorithms to calculate the precise equivalent value based on standard audio rates (e.g., 48kHz).

03 Your agent returns a clear answer: either the exact sample count you asked for, or confirmation if your timing aligns perfectly with millisecond boundaries.

The bottom line is that it takes complex time math out of your hands and gives you precise numbers needed for digital audio mixing.

Built For

This MCP is essential for professional audio engineers, mastering artists, and composers. If timing accuracy matters to your final mix, and you're sick of manually calculating sample rates in spreadsheets, this tool saves hours.

Audio Engineer

They use the MCP to guarantee phase alignment when integrating different sound sources or effects into a master track.

Music Producer

A producer relies on this tool to measure rhythmic elements precisely, ensuring loops and samples lock together perfectly in the DAW.

Sound Designer

They use it when building soundscapes that require micro-timing adjustments, like syncing Foley effects to a precise millisecond marker.

What Changes When You Connect

01 Stop guessing on timing. Use `ms_to_samples` to get the exact sample count you need, removing guesswork from your mix.

02 Verify time without complex math. The `verify_alignment` tool tells you instantly if a sample block is perfectly divisible by milliseconds, stopping drift before it starts.

03 Need to report timing? Use `samples_to_ms` to convert raw samples into clean millisecond metrics for documentation or client reports.

04 Work across any standard rate. The MCP handles 44.1kHz, 48kHz, and 96kHz rates automatically, so you don't have to change your process.

05 Save time on tedious math. Instead of opening a calculator app, you ask your agent for the conversion and get the precise number instantly.

Real-World Applications

Syncing Samples Across Different Rates

A sound designer needs to layer a recorded Foley track (48kHz) over existing music (44.1kHz). They ask the agent to convert 250ms of audio from one rate to samples at the other, using `ms_to_samples`, ensuring seamless timing without manual calculations.

Checking for Timing Drift

A music producer has a sample block that is supposed to mark the start of a measure. They use `verify_alignment` and find out the count doesn't fall perfectly on a millisecond boundary, letting them fix minor timing issues before rendering.

Calculating Mix Markers for Clients

An audio engineer needs to tell a client exactly how long a specific section is. They use `samples_to_ms` and input the sample count directly from their DAW, giving them a precise millisecond duration for the report.

Patterns to Avoid

Using rough estimates

✗ AVOID

Assuming that 1/4 second is exactly 20,000 samples. This fails if your sample rate isn't exactly 48kHz and causes noticeable timing drift.

✓ INSTEAD

Always use the Sample Offset Calculator to convert time units. Use `ms_to_samples` or `samples_to_ms` with your specific sample rate to guarantee mathematical precision.

Ignoring alignment checks

✗ AVOID

Sending a raw sample count into another tool without first checking if it hits millisecond boundaries. This leads to mismatched timing in the final audio product.

✓ INSTEAD

Before any conversion, run `verify_alignment` with your desired sample count. It will tell you exactly how much drift exists.

Doing manual math

✗ AVOID

Opening a spreadsheet and calculating (samples * 1000 / rate) for every single conversion. This is slow, prone to decimal errors, and highly inefficient.

✓ INSTEAD

Let your agent handle it. Use the Sample Offset Calculator's dedicated tools—like `ms_to_samples`—and get accurate results in seconds.

The Right Fit

Use this MCP if your workflow requires absolute, mathematically verifiable timing precision for audio content, such as mastering, sound design, or advanced mixing. You need to know the difference between 10 samples and 20 samples when working across multiple sample rates (44.1kHz vs 96kHz). Don't use this MCP if you are only doing rough estimates or general concept work; then a simple calculator will do fine. If your goal is just measuring time intervals in seconds, don't bother with the complexity of sample rate math—a basic timing tool works better. But because professional audio always requires knowing whether an offset aligns perfectly to a millisecond boundary, this MCP remains necessary.

Sample Offset Calculator: Solving DAW Timing Precision Issues

In the studio, timing is everything. Manually calculating sample offsets across different audio rates—say moving from 48kHz to 96kHz—is a nightmare of spreadsheets and potential decimal errors. You're constantly worrying if your calculated time marker will actually hit its intended beat or measure point.

With this MCP, you eliminate the math headache. Just tell your agent what conversion you need; whether it's `ms_to_samples` or `samples_to_ms`, and you get the precise number immediately. You spend zero time calculating offsets and 100% of your time making great music.

Sample Offset Calculator: Verifying Audio Sample Alignment

A major pain point is determining if a specific sample block actually lines up perfectly with common millisecond markers. If it's off by even a small fraction, your phase alignment suffers, and the mix sounds wrong. You have to manually check these offsets repeatedly.

Now, use `verify_alignment`. It instantly tells you if that sample count falls cleanly on a millisecond boundary or if there’s detectable drift. It gives you confidence in every single timing decision.

Sample Offset Calculator: 3 Tools for Audio Sampling Conversion

Use these tools to calculate precise conversions between time in milliseconds and specific counts of digital audio samples.

#	TOOL	DESCRIPTION
01	ms_to_samples	Calculates how many discrete audio samples fit into a specified number of milliseconds.
02	samples_to_ms	Converts an exact count of audio samples back into a duration measured in milliseconds.
03	verify_alignment	Checks if a given sample count is perfectly divisible by the millisecond boundary, flagging any timing drift.

See It in Action

Real prompts you can use once this MCP is connected to your AI agent through Vinkius Cloud.

U At 96kHz, how many samples are in 750ms?

Based on a 96,000 Hz sample rate, 750 milliseconds equals exactly 72,000 samples. This is ideal for marking precise quarter-note beats.

U Does a block of 144,000 samples at 48kHz align perfectly with ms?

No. At 48 kHz, 144,000 samples equates to 3000 milliseconds. However, because the conversion rate is slightly off the perfect boundary, there's a minor drift of 0.75ms that you should account for.

U Convert 24,000 samples to milliseconds at the standard 48kHz rate.

Conversion Result:

- **Samples Provided:** 24,000
- **Assumed Rate:** 48 kHz (Hz)
- **Calculated Duration:** 500.0 ms

Frequently Asked Questions

01 **How can the Sample Offset Calculator help with my DAW timing issues?**

This MCP lets you calculate precise sample counts for any millisecond duration. It guarantees that your time markers align perfectly in your Digital Audio Workstation, preventing frustrating phase drift when mixing different tracks.

02 **Do I need this tool if I'm only using one sample rate?**

Even if you stick to one rate, the Sample Offset Calculator is useful because it verifies alignment. It confirms if a raw sample count falls exactly on a millisecond boundary, which prevents subtle timing errors.

03 **What kind of conversions does the Sample Offset Calculator handle?**

It handles converting time between milliseconds and discrete audio samples. You can input either value, and it outputs the accurate equivalent for your given sample rate (like 44.1kHz or 96kHz).

04 **Is this better than using a standard math formula?**

Yes. The Sample Offset Calculator handles all the complex calculations—including different common sample rates like 48kHz and 96kHz—automatically. You just ask your agent, and it gives you the verified result.

05 **Can I use this for sound design projects?**

Absolutely. Sound designers often need micro-timing precision to sync effects or Foley recordings. This MCP ensures that every sample count is accurate down to the millisecond, giving your project professional polish.

Go Live in 60 Seconds

Get your connection token from **cloud.vinkius.com**, then paste the endpoint URL into any MCP-compatible client.

YOUR MCP ENDPOINT

```
https://edge.vinkius.com/[TOKEN]/mcp
```

CLIENT	WHERE TO CONFIGURE
Claude AI	Profile → Customize → Connectors → "+" → Add custom connector → Paste endpoint
Cursor	Settings → Features → MCP Servers → "+ Add New MCP Server" → Type: SSE → Paste endpoint
VS Code	Ctrl/Cmd+Shift+P → "MCP: Add Server" → add `"sample-offset-calculator": { "url": "…" }`
Windsurf	MCP Settings → `mcp_settings.json` → Add endpoint URL
ChatGPT	Settings → Tools & plugins → Add MCP server → Paste endpoint
Gemini	Extensions → Add MCP Server → Paste endpoint URL

ASK AN AI ABOUT THIS

Let your preferred AI explain this MCP server

- Ask ChatGPT
- Ask Claude
- Ask Perplexity
- Ask Gemini
- Ask Grok

READY TO CONNECT

Sample Offset Calculator is live on Vinkius Cloud.

Get your connection token, paste it into your AI agent, and start building. No SDK. No deployment. Just results.

Start at cloud.vinkius.com →

vinkius.com · support@vinkius.com

INDEPENDENT PLATFORM DISCLAIMER

DOCUMENT INFORMATION

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MCP Server	Sample Offset Calculator MCP
Server ID	`019f1f35-5606-73bc-bc6a-d7ca381257f0`
Platform	Vinkius Cloud for AI Agents
Endpoint	`https://edge.vinkius.com/{token}/mcp`

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