MCP SERVER | NO CODE | CLOUD HOSTED

Digital Audio Parameter Calculator MCP for AI Agents

Calculate Nyquist Frequency, Bitrate, and Storage Requirements for Media Production

Digital Audio Parameter Calculator provides instant analysis of digital audio configurations. It lets you calculate critical metrics like Nyquist frequency, dynamic range, bitrate, and required storage size for any given sample rate or bit depth. Quickly verify if your audio settings meet industry standards for broadcast, streaming, or archival needs.

A+ Quality Score 100/100

audio | bitrate | sample-rate | nyquist | storage | dsp

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vinkius.com/mcp/digital-audio-parameter-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.

Digital Audio Parameter Calculator MCP

3 tools available
Cloud-hosted on Vinkius

Working with high-fidelity audio means keeping track of a dozen moving parts: sample rates, bit depths, compression types, and target platforms. This MCP gives you the technical data needed to make sure your mix is flawless, whether it's going straight to broadcast or archived for future use. You can check core physics parameters to determine frequency limits, estimate exactly how much storage a project will consume, and pull up recommended settings for specific formats like CD or cinema masters.

It’s the kind of utility you need when time is short and accuracy is mandatory. If your team relies on complex calculations to move from raw assets to final delivery, this connector helps cut through the technical fog. It integrates into your existing setup via Vinkius's catalog, letting your AI client pull these essential specs directly into your workflow without needing a separate calculator or spreadsheet.

Core Capabilities

01 — Determine audio frequency limits

Calculates the Nyquist frequency and signal range based on selected sample rates and bit depths.

02 — Estimate project storage size

Projects bandwidth usage and total file storage consumption for different durations, channel counts, and bitrates.

03 — Retrieve industry-standard settings

Pulls up recommended audio parameters needed for specific professional applications like streaming or broadcast cinema mastering.

One Click on Vinkius — From Prompt to Execution

Available at **vinkius.com/mcp/digital-audio-parameter-calculator** — connect your AI agent in three steps.

01 Tell your AI client the variables you need to check, such as a sample rate and bit depth.

02 The MCP runs the necessary calculations against known audio physics principles and industry standards.

03 You receive immediate, precise figures for frequency limits, storage impact, or recommended presets.

The bottom line is that it takes complex technical inputs and delivers clear, actionable metrics for your final audio delivery plan.

Built For

This MCP is essential for professional sound engineers, post-production mixers, broadcast technicians, and media producers. If your job involves making sure an audio file meets a strict technical standard—be it FCC compliance or streaming bitrate limits—you'll need this tool.

Audio Engineer

Verifies that the project's sample rate and bit depth are technically sound for mixing, preventing potential frequency cutoff issues.

Post-Production Mixer

Determines the optimal final delivery format by comparing required storage impact against client bandwidth limitations.

Broadcast Technician

Quickly accesses established industry presets to ensure compliance with broadcast standards for specific formats like cinema or television.

What Changes When You Connect

01 Avoid compliance issues by using query_industry_presets to pull up mandated settings for specific formats like Cinema or broadcast.

02 Immediately check signal integrity. Querying audio physics confirms your sample rate and bit depth won't cut off necessary frequencies.

03 Stop guessing file sizes. Use query_storage_impact to get accurate bitrate projections, saving time on bandwidth planning.

04 Speeds up pre-flight checks dramatically. Instead of opening three different technical manuals, you run one calculation via your agent.

05 Ensures consistency across projects. You can cross-reference multiple parameters—from physics limits to required storage—in a single query.

Real-World Applications

Checking compliance for a new streaming title

The team needs to know if their 24-bit, 96kHz audio master will pass platform checks. Your agent uses the Digital Audio Parameter Calculator and runs query_industry_presets to confirm the exact bitrate required for the target service.

Archiving historical sound effects

You have a large library of old WAV files with varying specs and need to know how much storage they'll consume over five years. Your agent uses query_storage_impact to calculate the total projected size, helping you plan server capacity.

Mixing for a theatrical release

A movie project requires specific cinema mastering settings. Instead of searching documentation, your agent runs query_industry_presets and confirms that 48kHz/24-bit is the mandated standard for the final mix.

Verifying source material quality

You receive a sample file and aren't sure if its recorded specs are adequate. Your agent runs query_audio_physics to identify potential frequency limitations early, preventing major rework later in the pipeline.

Patterns to Avoid

Over-relying on manual calculation

✗ AVOID

Manually opening a datasheet and plugging values into an online calculator for bitrate, then switching to another tool for Nyquist frequency. This is slow and error-prone.

✓ INSTEAD

Instead, ask your agent to use query_audio_physics alongside query_storage_impact in one prompt. The MCP handles the multi-step math instantly, providing a comprehensive report.

Confusing file size with bandwidth

✗ AVOID

Assuming that because a 10-minute recording is small on your hard drive, it won't strain network upload limits. This overlooks the continuous bitrate calculation.

✓ INSTEAD

Always use query_storage_impact first. It precisely calculates the required bandwidth and storage consumption, giving you the real numbers needed for delivery planning.

Ignoring format standards

✗ AVOID

Mastering audio assuming general quality is enough, forgetting that a specific client (like a streaming service) has strict mandated presets.

✓ INSTEAD

Use query_industry_presets. It instantly checks the project against known professional guidelines for CD, Streaming, or Cinema, ensuring compliance before you mix.

The Right Fit

Use this MCP if your primary concern is technical verification and adherence to standards. If you need to know: 'Is my sample rate high enough?' or 'Will this file exceed the client's bandwidth limits?', this tool is perfect. It handles the physics behind audio delivery. Don't use it if you only need basic EQ adjustments or simple noise reduction; those are editing tasks, not calculation ones. If your goal is simply to rename files or move assets, a basic file management tool will work better. But if the decision hinges on math—bitrate, frequency limits, storage size—this MCP is what you need.

Digital Audio Parameter Calculator: Mastering Media Production Technical Specs

Right now, checking audio compliance involves a messy cycle of documentation lookups. You pull up the streaming service spec sheet, check the broadcast manual for cinema standards, then open a spreadsheet to estimate storage impact. Copy-pasting variables between tabs and running multiple calculations is tedious and highly prone to human error.

With this MCP, you simply ask your agent for what you need—for example, 'What are the specs for Cinema?' The system runs query_industry_presets instantly, giving you the definitive standards (like 48kHz/24-bit) without opening a single manual. You get immediate, verified technical parameters.

Digital Audio Parameter Calculator: Understanding Storage Impact in Media Production

The biggest time sink is figuring out how big your final deliverables actually are. You estimate the bitrate based on channel count, but you forget to factor in the total runtime or compression overhead. This often leads to unexpected bandwidth overruns right before a deadline.

Now, using query_storage_impact, you input the basic variables and get a precise projection of file size and required bandwidth usage immediately. It’s the single calculation that moves your project from 'maybe' to 'ready for upload'.

3 Tools for Digital Audio Parameter Calculator: Bitrate & Physics Analysis

Use these three tools to calculate everything from theoretical frequency limits to real-world storage consumption based on audio specifications.

#	TOOL	DESCRIPTION
01	`query_audio_physics`	Calculates the frequency limits and signal range using a specified audio configuration.
02	`query_industry_presets`	Retrieves recommended audio settings for professional standards like CD, Streaming, or Cinema.
03	`query_storage_impact`	Estimates the necessary bitrate and total storage consumption for a given audio project length and channel count.

See It in Action

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

U What are the recommended audio settings if I need to deliver this track as a Cinema master?

Cinema Master Presets

For theatrical distribution, use these standard settings:

- **Sample Rate:** 48000 Hz
- **Bit Depth:** 24 bits
- **Channels:** Stereo (or 5.1, depending on scope)

Please ensure your mix adheres to these standards for optimal playback.

U If I record a 30-minute stereo interview at 48kHz/24bit, how much space should I plan for?

Project Storage Estimate

Based on the parameters provided:

- **Bitrate:** ~1.5 MB/s
- **Total Duration:** 30 minutes (1800 seconds)
- **Approximate Total Size:** 2,700 MB (or about 2.7 GB).

This projection accounts for the required bitrate and channel count.

U What is the highest frequency I can reliably record if my sample rate is set to 96kHz?

Audio Physics Report

Using a 96 kHz sample rate:

- **Nyquist Frequency:** 48000 Hz (or 48 kHz).
- **Maximum Signal Range:** The audio signal cannot exceed this frequency and will be cut off.

This confirms your upper limit. If you need to record above 24kHz, you must increase the sample rate.

Frequently Asked Questions

01 **How does the Digital Audio Parameter Calculator help with streaming compliance?**

It checks against industry presets so you know exactly what bitrate and format your audio needs to be for a specific platform. You avoid costly re-renders because your settings match the required standards.

02 **I need to calculate file size, but which tool do I use in the Digital Audio Parameter Calculator?**

Use the storage impact function. It takes your runtime and bit depth details and gives you a precise total project size estimate in MB or GB. This helps with server planning.

03 **Is this MCP good for checking my audio's fundamental physics?**

Yes, it calculates core parameters like the Nyquist frequency based on your sample rate and bit depth. It tells you the actual technical limits of your recorded signal.

04 **Does the Digital Audio Parameter Calculator support multiple formats (e.g., CD vs Streaming)?**

It does. You can run industry presets to retrieve recommended settings for various professional applications, ensuring you pick the right parameters for your final output.

05 **What if my audio project is very long? Will the Digital Audio Parameter Calculator handle it?**

The storage impact tool handles large projects by calculating bitrate and total consumption. You just input the duration, and it gives you a scaled estimate of required bandwidth.

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 `"digital-audio-parameter-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

Digital Audio Parameter 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

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