

M C P   S E R V E R

N O   C O D E

C L O U D   H O S T E D

# Board Speed Calculation Engine for kiteboarding.

Simulate rider performance and equipment physics with precision.

Board Speed Calculation Engine provides high-fidelity physical simulations for kiteboarding performance. Your AI client uses this MCP to balance kite power against drag forces, allowing you to calculate terminal velocity, generate acceleration curves, and evaluate how specific equipment changes impact your top speed.

**A+** Quality Score 100/100

kiteboarding

physics

velocity

drag

simulation



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

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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

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## 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.

### 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.

### 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.

### 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**

Encryption at rest

**Ed25519**

PKI vault signatures

**24h TTL**

Ephemeral session keys

**V8 Isolate**

Sandboxed execution

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## 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

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## 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.

### 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.

### 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.

### 06 — Honeypot Trap System

Phantom credentials are injected into isolated environments. If a honeypot 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.

**FinOps**

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

**Firewall & DLP**

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

**Agent Activity**

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

**Tool Health**

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

**Incident Log**

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

Get started at [cloud.vinkius.com](https://cloud.vinkius.com) — connect your AI agent in under 60 seconds.

# Board Speed Calculation Engine MCP

4 tools available

Cloud-hosted on Vinkius

This MCP gives your AI agent the ability to run precise physics simulations for kiteboarding. Instead of guessing how a new setup might perform, you can use these tools to model the interaction between kite power, rider mass, and drag coefficients. You can determine the exact point where kite pull and water drag reach equilibrium to find your maximum stable speed. If you are testing a new board shape or fin configuration, the MCP calculates how those specific variables shift your performance profile. You can also map out how quickly a rider builds speed from a standstill by generating data sets that show acceleration over time. It is a technical tool for modeling speed potential against established industry benchmarks, helping you understand where a specific gear setup sits in the performance hierarchy.

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## Core Capabilities

### 01 — Terminal Velocity Modeling

Your agent calculates the maximum speed achievable under specific environmental and gear conditions.

### 02 — Equipment Variable Testing

The AI compares different gear setups to see how mass or drag changes the outcome.

### 03 — Performance Benchmarking

Your client compares simulated speeds against industry records to determine performance tiers.

### 04 — Acceleration Data Generation

The MCP provides the data needed to visualize speed build up over a time period.

# One Click on Vinkius — From Prompt to Execution

Available at [vinkius.com/en/ai-agent-connect/board-speed-calculation-engine](https://vinkius.com/en/ai-agent-connect/board-speed-calculation-engine) — connect your AI agent in three steps.

- 01 Connect your MCP-compatible client to Vinkius.
- 02 Provide your gear specs and environmental conditions to your AI agent.
- 03 The agent calls the specific calculation tool needed for your question.
- 04 The MCP returns the physics data or speed results to your agent.
- 05 Your agent presents the final calculation or data set to you.

Connect your client to Vinkius and start running simulations immediately.

## Built For

This MCP is built for professionals who need to model kiteboarding physics without manual math. You can hand off gear specs to your agent to get instant performance estimates.

### Equipment Designers

They use the MCP to test how new board shapes or fin sizes affect speed before manufacturing.

### Professional Kit Testers

They hand off gear configurations to the AI to compare theoretical performance against records.

### Physics Researchers

They use the simulation tools to model drag and kite power interactions.

## What Changes When You Connect

- 01 Calculates terminal velocity by balancing kite power against drag forces.



- 02

Models acceleration curves to show speed build up from a standstill.
- 03

Compares gear changes to specific speed outcomes.
- 04

Benchmarks setups against theoretical industry speed records.

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# Real-World Applications

## Gear Optimization

Test how a different fin size changes your maximum stable speed.

## Drag Impact Analysis

Calculate exactly how much speed you lose when increasing your drag coefficient.

## Performance Tiering

Check if a specific equipment setup qualifies as Elite performance based on speed records.

## Acceleration Profiling

Generate data sets to see how quickly a rider reaches top speed with a specific kite power.

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# 4 Tools Available

| #  | TOOL                             | DESCRIPTION                                                                                                    |
|----|----------------------------------|----------------------------------------------------------------------------------------------------------------|
| 01 | calculate_terminal_velocity      | This tool finds the maximum stable speed a rider can reach by balancing kite power against drag.               |
| 02 | compare_equipment_configurations | Use this to see how changing a single variable, such as fin size or board shape, shifts your top speed.        |
| 03 | evaluate_speed_potential         | This tool checks your current gear setup against theoretical industry speed records to categorize performance. |
| 04 | generate_acceleration_curve      | This tool produces a data set showing how speed builds up from a standstill over time.                         |

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## See It in Action

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

**U** What is the terminal velocity for 500N kite power, 80kg weight, 0.05 drag, and glass water?



The terminal velocity is 141.42 m/s.

**U** Is a speed of 45 m/s considered good for a professional kiteboarder?



A speed of 45 m/s is categorized as Elite performance.

**U** How much speed do I lose if I increase my drag coefficient from 0.05 to 0.07?



Increasing the drag coefficient to 0.07 results in a speed reduction of 12.35 m/s.

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## Frequently Asked Questions

### 01 What can this MCP simulate?

It simulates terminal velocity and acceleration for kiteboarding equipment based on kite power, mass, and drag.

### 02 How do I use this with my AI?

You connect your client to Vinkius once. After that, you just ask your agent to perform calculations or generate curves using the available tools.

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**03 Can I compare different board shapes?**

Yes. You can use the equipment configuration tool to see how changing variables like board shape affects your maximum speed.

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**04 Does it provide acceleration data?**

Yes. The `generate_acceleration_curve` tool provides a data set representing how speed builds up over time from a standstill.

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**05 How are performance tiers determined?**

The MCP compares your simulated speed against theoretical industry speed records to categorize the performance.

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**06 How do I calculate my maximum speed?**

You can use the `calculate_terminal_velocity` tool by providing your kite power in Newtons, your total weight in kilograms, the board's drag coefficient, and the water roughness multiplier.

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**07 Can I see how fast I will accelerate?**

Yes, the `generate_acceleration_curve` tool provides a series of data points showing velocity over time based on your specific equipment and environmental parameters.

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**08 How is speed potential determined?**

The `evaluate_speed_potential` tool compares your calculated speed against historical kiteboarding benchmarks to categorize your performance into tiers like Elite or World Record Contender.

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# Go Live in 60 Seconds

Get your connection token from [cloud.vinkius.com](https://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                                                                                         |
|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
|  <b>Claude AI</b>  | Profile → Customize → Connectors → "+" → Add custom connector → Paste endpoint                             |
|  <b>Cursor</b>     | Settings → Features → MCP Servers → "+" Add New MCP Server" → Type: SSE → Paste endpoint                   |
|  <b>VS Code</b>  | Ctrl/Cmd+Shift+P → "MCP: Add Server" → add <code>"board-speed-calculation-engine": { "url": "..." }</code> |
|  <b>Windsurf</b> | MCP Settings → <code>mcp_settings.json</code> → Add endpoint URL                                           |
|  <b>ChatGPT</b>  | Settings → Tools & plugins → Add MCP server → Paste endpoint                                               |
|  <b>Gemini</b>   | 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

# Board Speed Calculation Engine 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](https://cloud.vinkius.com) →**

[vinkius.com](https://vinkius.com) · [support@vinkius.com](mailto:support@vinkius.com)

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DOCUMENT INFORMATION

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|------------|---------------------------------------------------|
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| Platform   | Vinkius Cloud for AI Agents                       |
| Endpoint   | <code>https://edge.vinkius.com/{token}/mcp</code> |

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