MCP SERVER | NO CODE | CLOUD HOSTED

Avalanche Transceiver Range Calculator MCP

Plan precise rescue operations with electromagnetic signal data.

Avalanche Transceiver Range Calculator MCP provides rescue teams with the math needed for effective search operations. It calculates signal propagation based on burial depth and equipment models, determines how wide a searcher's path will be, and estimates the number of personnel needed to cover a specific area within a set timeframe.

A+ Quality Score 100/100

avalanche | search-and-rescue | electromagnetic | transceiver | emergency

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.

Avalanche Transceiver Range Calculator MCP

4 tools available
Cloud-hosted on Vinkius

When you are managing an avalanche rescue, you cannot guess how much ground your team can cover. This MCP handles the electromagnetic physics of transceiver signals so you can focus on the field. You can input specific burial depths and transceiver models to find the effective search radius. It also calculates the lateral width of a search strip and tells you exactly how many people you need to clear a specific area before your time limit runs out. Whether you need a quick check on a single metric or a full operational breakdown, your AI client can process these variables instantly to give you actionable numbers for the field.

Core Capabilities

01 — Signal Propagation Math

The AI calculates how burial depth affects transceiver detection distance.

02 — Manpower Estimation

Your agent determines the number of personnel needed to meet a time constraint.

03 — Coverage Planning

The AI calculates the lateral width of search strips for field teams.

04 — Scenario Summaries

Your agent generates a complete overview of search parameters in one step.

One Click on Vinkius — From Prompt to Execution

Available at **vinkius.com/en/ai-agent-connect/avalanche-transceiver-range-calculator** — connect your AI agent in three steps.

01 Connect your preferred MCP-compatible client to Vinkius.

02 Provide the transceiver model and burial depth to your agent.

03 Input the area size and time constraints for manpower math.

04 Receive specific metrics like range, width, or person count.

Connect your AI client to Vinkius and start running calculations immediately.

Built For

This MCP is built for professionals managing high-stakes mountain rescue and search operations.

Search and Rescue Leads

They hand off area dimensions and time limits to the AI to get manpower requirements.

Avalanche Safety Technicians

They use the tool to calculate signal ranges based on specific equipment models.

Emergency Coordinators

They use scenario analysis to plan the deployment of field teams.

What Changes When You Connect

01 Calculates search radius based on specific burial depths.

02 Determines personnel needs for specific time windows.

03 Provides strip width metrics for searcher deployment.

04 Processes complex electromagnetic signal data instantly.

Real-World Applications

Rapid Manpower Deployment

Calculate how many people to send into a zone to cover it within a strict time limit.

Equipment Capability Checks

Determine the maximum detection distance for different transceiver models and depths.

Search Pattern Planning

Find the optimal strip width for searchers to ensure no gaps in coverage.

Full Mission Briefing

Generate a complete summary of range, width, and manpower for a specific rescue area.

Patterns to Avoid

Guessing search area coverage

AVOID

You tell your agent to just find a way to cover the whole mountain with three people.

✓ INSTEAD

Use `calculate_strip_width` to find the actual lateral width of a single searcher's coverage first.

Ignoring burial depth variables

AVOID

You assume every transceiver reaches 50 meters regardless of how deep the victim is buried.

✓ INSTEAD

Run `get_effective_range` to get an accurate detection distance based on specific burial depths and equipment models.

Underestimating personnel needs

AVOID

You deploy a small team and hope they finish the sweep before the weather turns.

✓ INSTEAD

Input your area size and time constraints into `estimate_searcher_count` to see exactly how many people you need.

The Right Fit

Search and rescue leads and emergency coordinators should connect this MCP to their AI clients. Field technicians who need to move from guesswork to physics-based planning will find it useful. If you are just a casual hiker, you don't need this.

Avalanche Transceiver Range Calculator 4 Tools

These tools handle the electromagnetic physics and manpower math required for effective avalanche search operations.

#	TOOL	DESCRIPTION
01	analyze_search_scenario	This tool provides a full operational summary including range, width, and manpower requirements.
02	calculate_strip_width	Use this to find the lateral width of the coverage area provided by a single searcher.
03	estimate_searcher_count	This tool determines the number of people required to cover a defined area within a specific time limit.
04	get_effective_range	This tool calculates the maximum distance a searcher can detect a signal based on equipment and environment.

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 effective search range for a Pro-Grade transceiver buried at 2 meters with an orientation of 90 degrees?

The effective search range for the Pro-Grade transceiver at a 2-meter depth is 35.5 meters.

U How many searchers do I need to cover 5000 square meters in 600 seconds if each searcher moves at 1.5 m/s and the strip width is 40 meters?

You will need 3 searchers to complete the coverage within the 600-second limit.

U Provide a full scenario analysis for a 1000m2 area, 1.5m depth, Pro-Grade model, 45 degree orientation, 1.2 m/s speed, and 300s limit.

The operational analysis shows an effective range of 42.0 meters, a strip width of 78.5 meters, and 1 searcher required to complete the task.

Frequently Asked Questions

01 **What can this MCP calculate for avalanche rescue?**

It calculates effective search radius, strip width, and the number of people needed to cover an area within a time limit.

02 **How does burial depth affect the results?**

The tool uses burial depth to determine the effective search range for specific transceiver models.

03 **Can I use this with Claude or Cursor?**

Yes, you can connect this MCP to any MCP-compatible client like Claude, Cursor, or Windsurf.

04 **Does it require manual math?**

No, your AI client performs all the electromagnetic and manpower calculations using the provided tools.

05 **What information do I need for a manpower estimate?**

You need the total area size, the time limit, the searcher speed, and the strip width.

06 **How does burial depth affect the search range?**

Increased burial depth causes signal attenuation, which reduces the effective range calculated by `get_effective_range`.

07 **Can I calculate the total number of rescuers needed?**

Yes, use the `estimate_searcher_count` tool to determine the required personnel based on area, speed, and time constraints.

08 **Does the tool account for electromagnetic interference?**

Yes, providing an `interferenceLevel` to tools like `analyze_search_scenario` will adjust the results to account for environmental noise.

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 `"avalanche-transceiver-range-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

Avalanche Transceiver Range 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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DOCUMENT INFORMATION

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Platform	Vinkius Cloud for AI Agents
Endpoint	`https://edge.vinkius.com/{token}/mcp`

LICENSE & USAGE

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