

# Enabling alpha generation, execution optimisation and regulatory resilience with an analytics-ready tick data platform

Tick data is one of the most valuable and most difficult assets to work with in capital markets. It's high-volume, high-velocity and essential for everything from trading strategies and backtesting to regulatory reporting.

For many firms, legacy systems, inconsistent data formats and siloed workflows continue to slow access to data and hinder the speed of model development and generation of analytic insights.

This blog introduces how an analytics-ready tick data platform can help solve these issues by cleaning, structuring and indexing raw tick data to deliver it straight into research, trading, and compliance environments. A tick data platform removes common bottlenecks and enables teams to focus on generating business value by building models, finding trade signals, managing risk and meeting regulatory and compliance obligations.

This requires a tick data platform built on some key foundations:

- **Normalisation** to align data across venues and asset classes,
- **Cleaning and enrichment** to ensure data quality and consistency,
- **Indexing and cataloging** for fast data discovery
- **Flexible delivery into research**, trading and compliance environments.

These foundations transform raw data into high-value, actionable information enabling a wide range of use cases across the trade lifecycle. From execution benchmarking, alpha signal development, real-time risk monitoring or regulatory reporting, a structured tick data platform accelerates insight generation, reduces operational overhead and unlocks the value of your data.

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# Introduction

In the highly-competitive capital markets, extracting value from granular, high frequency time-series data is a strategic necessity to gaining a competitive edge. However, many firms are still constrained by fragmented data workflows and high costs of legacy infrastructure and architecture.

As the volume and velocity of tick data grows exponentially, legacy systems struggle to scale efficiently or support the needs for quantitative research, execution strategies and regulatory oversight. The result is delayed insights, higher operational costs and limited flexibility in responding to market opportunities or risks.

A modern, analytics-ready tick data platform addresses these challenges by combining scalable cloud infrastructure, intelligent data catalogs and automated delivery pipelines. These platforms transform raw data into actionable intelligence faster, more reliably and at a lower cost. This enables firms to unlock alpha, refine execution precision and streamline regulatory workflow, all while reducing time-to-insight and total costs of ownership.

## Why Structured Tick Data Matters

Tick data, by nature, is inherently noisy and arrives in staggering volumes with inconsistent formats, fragmented across venues and asset classes. Left unstructured tick data becomes a bottleneck and rather than creating alpha the complexity becomes a liability, not a competitive advantage.

A modern tick data platform transforms raw data into a high-value asset by:

- **Normalizing** across multiple sources and asset classes, resolving discrepancies in symbology and timestamps.
- **Cleaning and interpolating** missing or anomalous values to ensure analytical accuracy and reliability.
- **Enriching** with calculated fields, order book depth, spreads or corporate actions and events.
- **Indexing and cataloging** data for rapid discovery and self-service access across the enterprise, enabling faster onboarding of new use cases.
- **Delivering seamlessly** into quant research pipelines, execution engines and ML/AI environments, on-prem, cloud, or hybrid via shared cloud, API or SFTP.

This structured foundation supports advanced use cases from alpha-seeking models to best execution analysis and compliance reporting. It reduces manual wrangling, enhances governance and dramatically cuts time-to-insight, increasing signal quality and enabling faster iteration cycles.

# Tick Data Use Cases: From core functionality to cutting-edge insight

Analytics-ready tick data unlocks value across a firm's workflow. These use cases scale with data maturity, from foundational reporting to advanced machine learning.

## 1. Optimize Execution

Enhance trading outcomes and minimize cost slippage through real-time tick data analytics.

- **Execution Benchmarking:** Evaluate strategies against VWAP, TWAP, or arrival price to refine algorithmic trading.
- **Transaction Cost Analysis (TCA):** Monitor and reduce implicit and explicit trading costs across venues and asset classes.
- **Slippage Monitoring:** Track intraday market movements to reduce adverse selection in volatile conditions.

### Example Use Cases:

**Use Case:** Real-time execution optimization and cost control.

An asset manager integrates live tick data into VWAP and implementation shortfall models to dynamically track slippage.

**Outcome:** Reduced transaction costs through improved execution timing.

## 2. Generate Alpha with Microstructure Insight

Use structured tick data to power ML models, arbitrage strategies and short-term signals with high predictive power.

- **Alpha Signal Development:** Train machine learning models (e.g., LSTM, XGBoost) using clean and enriched time-series data.
- **Cross-Asset Arbitrage:** Exploit latency or pricing discrepancies across FX, equities, and derivatives.
- **Microstructure Pattern Recognition:** Detect short-term anomalies or mean-reverting behavior for intraday trades.
- **Client Strategy Attribution:** Analyze post-trade data to provide clients with signal-level performance diagnostics.

### Example Use Cases:

**Use Case:** Alpha signal development using ML

A quant hedge fund trains LSTM models on enriched time-series features (e.g., spread shifts, order book imbalance).

**Outcome:** Improved intraday hit rate across FX strategies.

**Use Case:** Cross-asset arbitrage modeling.

A derivatives desk monitors tick-level correlation breakdowns between ETFs and their underlying components.

**Outcome:** Triggered short-term stat arb trades with Sharpe ratio improvement.

### 3. Enhance Risk Management

Gain visibility into exposures and dynamically respond to market stress.

- **Risk Modeling:** Feed tick data into volatility and correlation models for timely hedging or scenario analysis
- **Stress Testing & Scenario Simulation:** Replay tick-level data from black swan events to test and refine execution logic.
- **Inventory Risk Management:** Use depth and velocity metrics to dynamically adjust market-making spreads.

#### Example Use Cases:

**Use Case:** Strategy stress testing

A broker replays historical tick data from 2020 market shocks to test algorithmic performance under stress.

**Outcome:** Refined execution strategy with new guardrails based on flash crash behavior.

**Use Case:** Market-making inventory risk control

A trading desk adjusts bid-offer spreads using depth-of-book and velocity metrics.

**Outcome:** Reduced inventory exposure during volatile trading sessions

### 4. Simplify Regulatory Compliance

Streamline regulatory processes and improve transparency with granular audit trails.

- **Regulatory Reporting & Trade Reconstruction:** Recreate full market context for MiFID II, SEC, and other mandates.
- **Surveillance & Market Abuse Detection:** Identify spoofing, layering, and other anomalies using rule-based or ML detection.
- **Audit-Ready Logging:** Maintain immutable records of market interactions for internal and external review.

#### Example Use Cases:

**Use Case:** Trade reconstruction and reporting

Firms leverage audit-ready tick logs to support SEC and MiFID II transaction reporting.

**Outcome:** Improved regulatory response times and reduced manual effort by 40%.

**Use Case:** Surveillance for market abuse

A compliance team detects layering activity using anomaly detection on enriched order flow data.

**Outcome:** Flagged over 300 suspicious events with automated workflows.



# Conclusion: The foundation for alpha starts with the right data

The value of tick data is only as strong as the platform that delivers it. Clean, structured, analytics-ready tick data is the prerequisite for robust quantitative research, efficient execution and effective risk management.

Whether you're a head of trading, a quant lead or a compliance officer, DataHex helps you:

- Cut time-to-insight
- Improve alpha signal reliability
- Streamline regulatory reporting
- Scale analytics without scaling infrastructure

## About RoZetta Technology

RoZetta's proven DataHex Platform-as-a-Service directly supports this vision by delivering modular, cloud-based solutions tailored for **analytics-ready tick data**. DataHex empowers global exchanges, vendors, and financial institutions to modernize infrastructure, streamline operations, and rapidly launch new data, analytic, and investment products—including indices and ETFs.

By providing a clean, structured, and easily accessible tick data foundation, DataHex helps firms unlock alpha, optimize execution precision, and enhance regulatory resilience, all while significantly reducing the total cost of data ownership.



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Discover how **DataHex** can accelerate your data modernization, unlock new alpha, and streamline your operations with an analytics-ready tick data platform.  
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