Integrated Risk Solutions

Bringing clarity to manage risk, protect alpha and build your business

Broadridge®
Intelligent Risk, Trading and Portfolio Management Solutions

Silo-driven risk analysis and decision-making no longer meet the holistic requirements in today’s investment world. Firms need an integrated view of risk with the transparency to see both market and credit exposures across all asset classes – at any point in time. Smart firms can gain an operational advantage through comprehensive risk management solutions that enable actionable real-time decision-making.

Broadridge Portfolio Risk delivers a distinct offering customized to the complex needs of hedge funds and asset managers. Our platform/solution, etc. provides hedge fund administrators and prime brokers with comprehensive risk management tools that are integrated with portfolio and order management software in a single, compliant and cost-effective solution.

You can manage the full trade lifecycle in one application with real-time market data across all asset classes. We also provide analytics and an extensive customizable library of reports.

Key features include pre-and post-trade compliance tools and alerts that are fully integrated with exceptional data management and a flexible user interface. Portfolio Risk is ideal for hedge funds that need a dynamic, effective and efficient risk management platform but want to minimize the technology spend.

Comprised of three integrated modules that work together seamlessly, the solution can be customized to fit the requirements and evolution of your firm.
A Unified Order and Portfolio Management Platform

**Key Features**

- Flexible trade modeling and re-balancing for order generation.
- Complete electronic trading and order routing solution with FIX connectivity to executing brokers, trade algorithms and industry-leading EMS's platforms.
- Comprehensive position and P&L viewer with seamless integration to real-time market data feeds.
- Integrated pre- and post-trade compliance tools including real-time alerts, customizable rules and full audit reporting for firmwide compliance management.
- Dynamic connectivity with prime brokers to identify short availability and locates in real-time, with complete borrow fee and rebates tracking.
- Industry-leading data integration to automatically setup your security master reference data and process your corporate actions.
- Two-way counterparty communication and automated daily reconciliation.
- Robust reporting tool to create custom reports, integrate 3rd party data, and automate report generation & delivery.

**Risk Master Provides:**

- Customization and flexibility that enables the valuation, simulation and reporting of assets and risk factors tailored to specific requirements.
- Coverage of multiple asset classes and risk perspectives across an extensive range of risk factors, asset classes and investment strategies.
- Fully integration with industry leading Numerix® CrossAsset Library, representing industry best-practice in speed and accuracy, enabling rapid calculations for even the most complex instruments.
- An easy interface with custom model libraries or in-house excel pricing to better aggregate pricing all instruments into a single risk container.
- Scalable risk management and reporting, enabling firms to focus on

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<thead>
<tr>
<th>Order Management System</th>
<th>Portfolio Risk</th>
<th>Portfolio Management System</th>
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<tr>
<td>• Multi-asset class decision support</td>
<td>• Scenario Analysis - Deterministic, historical and predictive</td>
<td>• Historical shadow of counterparties</td>
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<td>• Portfolio modeling, rebalancing and order entry</td>
<td>• Historical value at risk</td>
<td>• Counterparty reconciliation and settlement notification</td>
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<td>• Real-time market data and P/L</td>
<td>• Real-time sensitivities at security, position, and aggregate levels</td>
<td>• Non-trade activity tracking (reorgs, cash movements, fees, and expense management)</td>
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<td>• Pre-and post-trade compliance</td>
<td>• Simulated trades</td>
<td>• Historical &quot;as of&quot; reporting (Date-to-date, MTD, QTD, and YTD)</td>
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<td>• Trade execution and order routing</td>
<td>• Suggested hedges</td>
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<td>• Automated trade allocation</td>
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<td>• Customizable pricing rules</td>
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Multi-Asset Class Valuation and a Robust Risk Engine

Our Risk Master engine is a fully-featured and flexible risk management tool that provides intelligent risk mitigation across an entire portfolio or at the trade level. This powerful tool works for multiple asset classes, allowing control of risk exposure to both market and counterparty risk better enterprise-wide decision making and the ability to quickly act upon any identified risk tolerance breaches.

Know Your Market and Credit Risk Exposure
Risk Master delivers the critical tools to monitor exposure to market and credit risk across markets, trades, counterparties and portfolios. The powerful analytics platform allows firms to price and model any instrument providing a consistent valuation framework for pricing to enable improved hedging of complex portfolios.

Scenario Analysis
- Analyze the impact of deterministic scenarios, by shifting market inputs such as price, currency rate, yield curve, volatility surface
- Leverage historical data to generate scenarios
- Deploy predictive analysis to allow the client to define shifts in core market variables
- Propagate to the market environment via multiple linear regression

Sensitivity Analysis
- Identify concentrations of interest rate and credit spread risk
- Aggregate sensitivity for any portfolio to each tenor point on each yield or credit curve
- Calculate portfolio sensitivities to equity prices and FX rates
- Utilize Greeks in scenario analysis

Value-at-Risk (VaR)
- Calculate VaR and Stressed VaR intraday (including marginal, incremental, component, conditional [ETL/ES])
- Perform calculations on any set of positions and portfolios

Credit Valuation Adjustment (CVA)
- Quantify future exposure by assessing credit quality of counterparty, and translating this exposure into a credit charge (CVA)

Potential Future Exposure (PFE)
- Estimate the loss if counterparty defaults at some time in the future

Back-Testing
- Test the validity of VaR calculations versus portfolio P&L using both clean and dirty methods
Flexible On-Demand Reporting

Through a comprehensive combination of tools, Broadridge delivers flexible risk reporting that supports regulatory compliance and enables risk-informed investment decision-making. You can choose from an extensive list of reports, including all risk measurements plus portfolio mark-to-market and P&L reports. Configuration of any report is highly flexible allowing clients to select the market data to be used, pricing policies to be applied, and numerous additional select variables.

**Regulatory Reporting**
Calculate and report regulatory risk requirements such as AIFMD and Form PF

**Back Testing**
Back testing reports compare daily VaR results to P&L results and records the number of exceedances (number of times that daily P&L exceeds VaR)

**VaR**
Supports several types of VaR reporting

**Sensitivity Analysis**
Quickly visualize concentrations of interest rate and credit risk or currency and equity exposure

**Report Manager**
A Complete Solution

Broadridge provides a flexible and scalable solution for managing the risks throughout your entire organization. Our Portfolio Risk and Risk Master solutions can be fully integrated across your existing systems, service providers and data partners. We offer a model for the front-office that is differentiated by neutrality, strong risk and compliance capabilities. We also offer a platform that functions across global locations and investment strategies and is supported by a robust trading network and third-party connectivity.

**Powered by High Quality Data**
Consistent high-quality data is crucial to the viability of any risk platform. Our data management products ensure that complete capture/manage full trades, positions, and all reference data feeds to support a risk infrastructure that lowers the total cost of ownership.

**Integrated Data and Analytics Partners**
- Bloomberg FT Labs
- Interactive Data Markit
- Monis Numerix
- Thomson Reuters

**Grid Computing Functionality**
With Risk Master and Grid Computing functionality for high computational performance, along with a GUI built specifically for trade capture, the system takes you beyond the limits imposed by the Excel application interface. This feature makes the platform infinitely scalable to handle the largest and most complex portfolio analysis and risk scenario testing.

**Flexible Deployment**
Risk Master is a scalable, future-proof platform implemented with distributed architecture based on the Microsoft.NET framework to manage various deployment possibilities—from single-user to enterprise-wide rollouts. Deployment is turnkey and efficiently plugs into your existing operations infrastructure with no need to re-architect systems for quick time-to-market.

Our secure, cloud-based delivery model offers significant value to both Portfolio Risk and Risk Master with the strength of our technology infrastructure and our global service model to ensure rapid implementation, constant uptime and around the clock support.

**Data Security and Infrastructure**
We provide highly scalable systems are built to support our clients’ growth, providing 24/7 reliability even during periods of extreme volatility and volume. Broadridge is one of only nine U.S. financial industry providers to receive ISO 27001 certification and two Tier III Plus data centers help ensure the security of client data.

**Relationship Model**
Broadridge delivers deep domain knowledge and 50+ years of experience supporting financial firm operations with a dedicated account manager and centralized technology help desk.
Comprehensive Asset Class Coverage

**Equity Baskets**
- Basket Notes with Knock-Out
- Custom Equity Basket-Linked Notes/Swaps
- Best-of/Worst-of Basket Options

**Fixed Income**
- Fixed Coupon Swaps/Bonds Basis Swaps
- Power Reverse Dual Currency Notes
- CMS-Linked Swaps/Bonds
- Range Accruals Zero-Coupon Swaps
- Callable Zero-Coupon Bonds/Swaps
- CC Spreads
- CC Chooser TARNs Inverse Floaters
- FX Digital Floaters
- FX-Linked TARNs/Inverse Floaters
- Rainbow Swaps/Bonds

**Equity**
- American Options European Index Options
- Compound Index Options Dividend Swaps
- Variance Swap Index Futures
- Performance-Linked Swaps/Notes Custom Equity-Linked Notes/Swaps Hybrid Index Corridor Option

**Inflation**
- Custom Inflation-Linked Notes/Swaps

**Credit**
- CDS
- CDS Options
- CDS Indices
- CDS Index Options
- Single-tranche CDOs
- CDO Tranche Options NTD
- Vanilla Rates Swaps/Swaptions Caps/Floors
- Forward Rate Agreements Amortizing Swaps

**FX**
- Swaps/Forwards
- Non-deliverable Forwards/Options European
- Options (Fade-In/Fade-Out, Barrier)
- Bermudan Fade-In Options Accelerators
- FX TARNs
- Digital Range Accrual with Knock-Out Custom FX- and FX-Basket-Linked Notes/Swaps

**Exchange Traded**
- Government Bond Futures
- Short Rate Futures

**Custom Derivatives**
- Callable Path-Dependent Products Structured Products