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Algorithmic Trading Directory

April 2011

Director's
fourth edition

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Foreword

The onward march of the algorithmic world continues with no fewer than 30 suppliers featured in this the fourth edition of the *A-Team Algorithmic Trading Directory*. I'm once again honoured to welcome you to this growing resource and hope you continue to find its contents useful. And once again our thanks go to our sponsor Fidessa.

As with last year, the directory has grown not only in terms of number of supplier profiles. The range of services being offered by suppliers is also widening, as competitors seek to differentiate their overall algorithmic trading suite. At the same time, the number of third-party interfaces through which brokers are making their algorithms available is also expanding.

While the range of execution venues and markets able to handle algorithmic trades has grown too, this year is likely to see some consolidation if planned mergers between exchange groups proceed as planned. These include Bats Markets' acquisition of Chi-X Europe – although the merged entity will continue to offer both trading books concurrently – as well as London Stock Exchange's planned 'merger of equals' with Canada's TMX Group and Deutsche Boerse's planned combination with NYSE Euronext. No firm plans for consolidating have yet emerged from these initiatives, but it's likely that at least some overlapping markets could be merged.

Meanwhile, firms' algos are becoming ever more sophisticated. Today's state-of-the-art are flexible algorithms that can adapt to market conditions, by pausing an order or halting one strategy to pursue another.

Adding to the complexity are incoming regulations that will require brokers – and exchanges – to take responsibility for clients' risk profiles ahead of the trade. Algorithms will need to be adapted to take into account these new requirements, with the promise of yet more innovation in time for next year's edition.

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Algorithmic TradingDirectory

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Fidessa

The Lofty Aspirations of Today's Global e-Desks



By Kristin Kelly, Global Product Manager Algorithmic Trading, Fidessa group

Electronic trading desks, often referred to as 'e-desks' in the US, have growing significance within trading firms on both sides of the Atlantic. Whether it is offering industry-standard regional algorithms or end-to-end automated global order management, a substantial percentage of the brokers' business will be derived from the e-desk in 2011.

While many firms have some form of e-desk, we expect to see the desk's capabilities extend to other market participants who are gaining access to complex automated workflows as technological developments and innovative delivery methods become more widespread. At the same time, we will continue to see the globalization of these technology platforms as firms expand their international reach to offer trading opportunities on non-local markets and attract customers from overseas.

Evolving requirements

The overarching trend is a simple one: a greater role for e-desks. But the end objectives of the e-desk are rather more complex. E-desk is a broad term that covers a number of activities, but in an ideal world an e-desk

would cover most of the following:

- Support an extensive suite of electronic trading strategies on a global basis;
- Achieve automated handling of incoming orders, with extensive risk checking and easily managed message translation capability, on an efficient and low-latency basis;
- Automate the execution of orders based on a client's customised handling instructions, the firm's market execution technology and a best-of-breed algorithm philosophy;
- Intelligently internalise specific order flow in conjunction with the use of dynamic risk management strategies;
- Support automated risk management through auto-hedging and position management;
- Leverage comprehensive, low-latency smart-order routing strategies for quality execution and adherence to compliance risk controls.

Given this list, it becomes clear that the technological capabilities of the e-desk go beyond just the algorithms in use. Under-

pinning the global e-desk is a properly managed connectivity network that enables a firm to monitor its client network to determine which network solutions are the best from a cost perspective and to determine whether the client flow is there to justify the connection at all. Such a centralised system, which allows firms to evaluate, cancel, add and amend client connections, is an invaluable tool and since the costs of connectivity can sometimes outweigh those associated with the order management system (OMS) itself, it is a priority area.

Firms should also have the means to properly manage the message flow in order to provide a true one-stop shop for the full range of their customers' trading needs, from direct market access (DMA) and algorithmic orders, to derivatives and baskets. Transparent FIX middleware solutions enable firms to translate customers' desires into appropriate instructions for the chosen destination seamlessly. If that destination is international, then the ability to queue international order flow appropriately will be required.

Aside from its connectivity to the wider

marketplace, an e-desk is only as good as its risk management tools. Consolidated counterparty risk controls, in particular, have almost inevitably become a critical consideration since they allow the firm to monitor any given client's exposure across multiple regions and different order flow types accurately. In the US, risk checks on market-bound orders are also required under the SEC's new 15c3-5 market access rule. It is worth noting that risk checks can improve the customer offering and, if installed properly, need not have a negative impact on the efficiency of the system.

Automated order handling strategies remain complex, whether they are in a FIX engine or the OMS. Even at the simplest level, brokers should have the ability to automatically evaluate a customer's order flow based on the region and desired trading strategy. Meta algorithms can be incorporated into the desk to run decision-making processes that determine the best algorithm for the order, taking into account the customer, region, current market analytics and basic order attributes.

Automating order handling in this way



F Strength in breadth

Fidessa systems are trusted because they work, and – just as important – they work together. We understand what the buy-side needs and what the sell-side wants, and our solutions span every possible aspect of the trading and investment process. With 30 years of experience, 1,600 expert professionals and operations across Europe, the Americas, Asia Pacific and the Middle East, you can trust us to keep you trading, 24/7.

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>> also allows for customisation of strategies based on counterparty. Firms that wish to distinguish themselves from other algorithm providers are focusing on customisation of industry-standard models. Providing these customisations while maintaining a fully automated, commingled, direct strategy access platform benefits both the customer and the brokerage. Flexibility is critical to these direct access arrangements and interaction with routing rules, as well as enrichment parameter settings, should be user-friendly and available on the fly.

In today's market, comprehensive low-latency liquidity access can dictate the success of an algorithmic strategy. Orders that are ultimately handled internally by the firm's automated trading strategies should exploit the firm's electronic execution management tools. The refinement of smart order routing strategies will be a continuing trend in 2011 as firms strive for ultra-low latency global market access in conjunction with highly evolved dark/lit liquidity sourcing logic. The expansion of these liquidity seeking execution models is broadening market access offerings for the buy side, and we are seeing more of these buy-side client firms taking the hybrid algorithms and working them remotely.

Trading in the dark

Perhaps the more significant trend when it comes to smart order routing is the growth of dark pools: whether they be a hybrid of lit and dark, internal crossing, buy-side crossing networks or specific dark MTFs. Connectivity to such pools is becoming

more important and smart order routing logic that intelligently seeks dark liquidity opportunities in an efficient manner is the backbone of execution quality for algorithms in many regions. Although smart order routers with dark-seeking capabilities have been available for some time, albeit nowhere near as commoditised as their lit counterparts, they are now able to leverage both the hidden inter-spread orders of the lit markets and dark pools in the same algorithmic process. In Europe, aggregators are also enabling one-stop access to many of the dark pools in operation today.

The goal now is for smart order routers that are dark aware across the entirety of the grey-to-dark pool spectrum and that enable firms to use one or a series of interchangeable SOR steps to interact speculatively in sequence with sweeping lit exchanges. These new smart order routers incorporate data analytics and the creation of heat maps that enable traders to target markets with dynamic strategies rather than adopt a static approach to sweeping.

That said, the intelligent search for liquidity will continue to include the evaluation of a firm's own liquidity opportunities that can be leveraged through internalization engines. There are signs that high-margin OTC business is experiencing greater levels of electronification across the block-trading business. Indeed, there has been a growing emphasis on internal crossing and dark trading of institutional order flow which follows in the footsteps of existing methods of working smaller clips of orders. A critical aspect for any crossing system is

>> the ability to determine the eligibility of the order flow based on counterparty and order type. When elevated to a certain level, a firm's internalisation engine can become a commodity in itself – attracting both sell-side and buy-side flow.

Greater use of internal order crossing within the tier one firms has, arguably, given them better algorithm performance and has, to an extent, made other brokers seem less competitive. However, that may change with the arrival of MiFID II, which will define what brokers can do in terms of interaction with various dark venue types, and it appears that regulations will tighten with regards to broker crossing networks (BCNs) and operators of other dark venues. Once direct access is given to one of these venues, it will be obliged to register as an MTF. The technological requirements for reclassification of BCNs may be easier to meet than the regulatory burdens. It is possible that firms could end up with a range of different crossing services, each with a different profile of flow going through it. But whatever the outcome of the new MiFID regulations, algorithms and smart order routers will need a degree of robustness and adaptability to navigate this shape-shifting landscape.

In the meantime, firms that do internalise, especially in an automated fashion, benefit significantly from running strategies that automatically unwind positions that breach their internal risk parameters, or to capture profit based on market opportunities. The type of position management and hedging models that are considered most

useful will therefore largely be dictated by the degree to which the firm commits its capital. Some firms are looking to automatically hedge most positions in a more dynamic fashion, whether using derivative vehicles or underlying instrument baskets for their ETF positions. These position management and electronic hedging models, when used in conjunction with automated order handling models, take the firm's electronic trading desk into a new sphere. Going beyond the basics of offering customers the standard electronic trading strategies, they provide a truly efficient global portal for all their customers' trading needs, while adhering to their firm's own risk profile.

Finally, there continues to be a significant increase in volumes in the program trading space as well as the growth of automated basket handling. Program traders have long regarded efficiency to be the determining factor for the success of their platforms and gateways, and tools that receive electronic baskets and effectively break down the components for speedy analysis are still the most common requirements. However, the industry is seeing a meaningful increase in automated trading strategies for baskets. This is allowing more firms to offer direct access to automated program trading algorithms. As with other algorithmic access, the crucial components to offering electronic access to program trading models are customisation, routing tools and the appropriate parameter enrichment and translation.

Focus on delivery

To accompany these technological advances

we are seeing changing patterns in the way they are delivered. For many firms, a best-of-breed approach is proving to be the ideal method of seamlessly offering algorithmic strategies for all of their order flow. As a result, we are seeing an increasing number of broker algorithms available on a white-labeled basis, and being offered by sell-side firms to accommodate regions or models that they do not cover with their own proprietary models. By leveraging FIX translation tools, the order flow is managed electronically, and delivered efficiently to the appropriate final destination with the right parameter enrichment. While white-labeling has substantially increased the choice of algorithmic offerings for the customers of smaller brokers, it has also generated very large flow for the top five algorithmic players.

Offering DMA to exchanges all over the world using both internal networks and a network of international brokers is thus an important element in the global e-desk. Brokers can now choose to implement DMA strategies, either from within their OMS infrastructure or from a lower latency market gateway tool, and can offer ultra-low latency market access for customers' proprietary algorithms via co-located exchange access. In today's market, brokerage firms can find new means of acquiring these types of platforms outside of the traditional prohibitive technology investments.

Taking into account the necessary risk management and message translation tools, the best market access solution is often a regional broker's expanded smart order

router that addresses the natural fragmentation existing in a region. Appropriate electronic order handling models thus give buy-side customers access to global markets via their regional broker services.

Full-service electronic trading desks will continue to develop in the larger broker/dealers, but the ability to offer full-service functionality will also extend to other smaller firms. Increasingly, these firms will exploit the technological advancements that are continuing to level the playing field and which are enabling them to broaden their offerings. And while customer service remains a priority in this post-financial crisis market, the ability to offer the necessary balance of automation and attentiveness to satisfy a specific customer base is becoming accessible to more and more market participants.





London

Stock Exchange Group

Exchange Hosting: Because Speed Matters

By Nigel Harold, Head of Business Development within the London Stock Exchange technology group

Exchange Hosting is the London Stock Exchange's lowest latency connectivity option for firms looking to gain the fastest access to the Group's markets. Trading participants, information vendors and solution providers locate their servers physically within the Exchange's own data centre, providing ultra-low-microsecond access to our trading matching engines and real-time market data. Round-trip connectivity latency is as low as 30 microseconds for clients hosting at the Exchange.

Exchange Hosting has been an instrumental component of the Exchange's strategy to increase the flow of liquidity onto its markets by reducing round-trip latency times and increasing the likelihood of successful trading strategy execution. The service has enhanced and extended the Group's range of connectivity options, and gives flexibility to participants to connect to their hosting equipment through a choice of telecommunications providers.

The introduction of Exchange Hosting has led to the creation of a strong community of latency-sensitive trading firms and providers at the facility, including a number of key Prime Brokers who are able to facilitate client flow within the data halls. This enables

non-members to receive the lowest possible latency real-time market data direct from the Exchange, and act upon the data by sending orders (via a short cross connect) to one or multiple Brokers who are located within the same data centre, for entering on to the order book, which is also located within the same building.

Access to Multiple Markets

The London Stock Exchange's UK cash markets have recently migrated to the new Exchange trading platform, making the exchange the fastest in Europe. Developed by London Stock Exchange Group's leading trading technology business Millennium IT, the new trading platform offers the Exchange's clients superior technical performance, consistently low-latency and enhanced functionality.

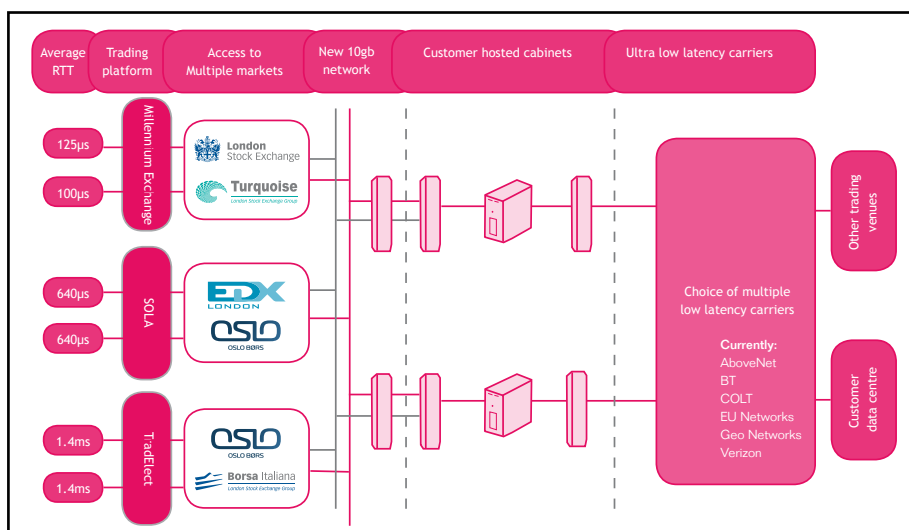
Key benefits that clients of Exchange Hosting have identified as adding value to their business are:

- Hosting physically within the same data centre as a number of markets:
 - London Stock Exchange
 - Turquoise Cash Equity and Derivatives market (formally EDX London)

- Borsa Italiana markets (MTA, MOT and ETFplus) that are currently on TradElet in London
- Borsa Italiana access is provided remotely to the IDEM derivatives market based in Milan, and will be offered for other markets hosted in Milan
- Oslo Børs Cash Equity and Derivatives

markets

- Strategically located hosting facility within central London, well situated to achieve good average latency to multiple trading venues to the east and west, and client sites in and around London.
- A flexible connectivity model providing access to a range of industry leading low



Latencies identified are 99 percentile averages – accurate at time of print

March 2011 >>



latency carriers.

- One of the first in the world to offer new 10Gb cross connectivity to trading and information systems.
- Low latency access to a growing community of Prime Brokers to facilitate trading and other essential support services for non-members.
- Access to low latency consolidated market data and onward order routing to multiple external execution venues.

Sponsored Access for London Stock Exchange and Turquoise

The new Sponsored Access service for the London Stock Exchange and Turquoise markets enables non-members to directly connect to the respective trading systems with the exchange-level pre-trade risk checks. This new service will further enhance the opportunities for clients wishing to participate in our markets from within the Exchange Hosting Service.

World Leading Matching Engines and Market Data Systems

Our world-leading Millennium Exchange platform averages 99 percentile latency; the round-trip time is 125 microseconds for the London Stock Exchange Market and 100 microseconds for the Turquoise Cash Equity market. This provides traders with the ability to complete execution with immense speed, particularly when physically close to the platform itself.

New Milan Hosting facility

As the globalisation of markets continues, hosting in key centres across the world has become

increasingly important to the high frequency trading community as participants strive to reduce latency associated with geographical location.

To facilitate this, the London Stock Exchange Group recently launched a Milan Hosting Service for firms looking to gain the fastest possible access to the Borsa Italiana's services in Milan. It currently allows market participants and information vendors to locate their servers within the data centre that hosts Borsa Italiana's IDEM Market and Data Dissemination Service (DDM+), providing low-microsecond access to the Borsa Italiana's IDEM matching engines and market data feed gateways, as well as other Milan hosted markets.

Finally, the requirement for data across multiple venues has also significantly increased, with multiple trading venues. To ensure clients are able to trade multiple market strategies the Exchange Hosting Service, in partnership with QuantHouse, offers an ultra-low latency Market Data and Order Routing Service to all major European and US execution venues for clients located in the Exchange's hosting facility. The Exchange has recently extended its offer to provide a free one-month trial of these services.

If you are interested in hearing more about how your business and trading strategies can benefit from the fastest access to the Exchange's Group markets through hosting, please contact Andrew Bailey – Hosting Product Manager: hosting@londonstockexchange.com or call +44 (0)207 797 4114. Alternatively, visit the Exchange's web site www.londonstockexchange.com/hosting for further details.



London
Stock Exchange

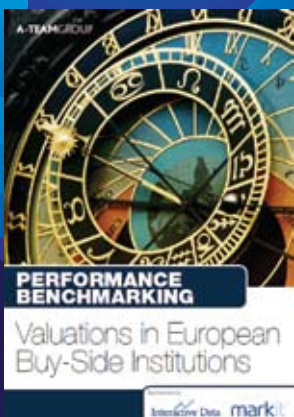
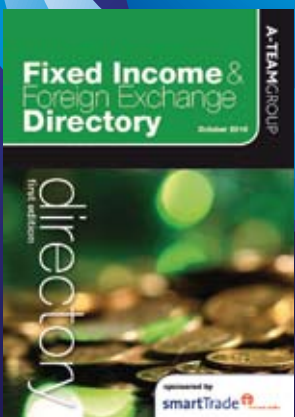
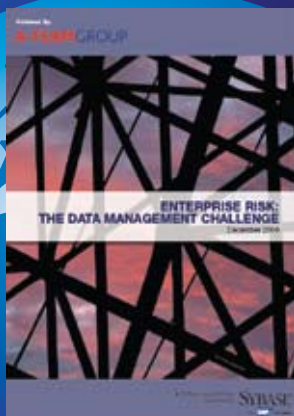


**Because speed
matters**

Exchange Hosting™ - The ultimate low latency connectivity

- **Your hosted cabinet will be located in the same data centre as the matching engines for:**
 - London Stock Exchange
 - Turquoise Cash Equity
 - Turquoise Derivatives (formally EDX London)
 - Oslo Børs Cash Equity
 - Oslo Børs Derivatives
- **Strategically located within central London, you will be ideally positioned to achieve the best average latency to multiple UK trading venues.**
- **Our open connectivity model means you can connect to your cabinet using a number of industry leading low latency carriers.**
- **You can choose to connect to the trading system via our 1Gb or new 10Gb ultra low latency network.**
- **Through our partnership with QuantHouse you will be able to access market data and onward order route to multiple external venues.**

For more information contact Andrew Bailey T: +44 (0)20 7797 4114 or email us at hosting@londonstockexchange.com
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A-Team Research

A-Team Group's research reports and surveys provide invaluable reference guides to the financial IT industry, whether you need to understand an issue from a strategic industry perspective, size the market, or compare suppliers and their services. No desk should be without them. As well as our published reports, A-Team conducts proprietary and customized market research and surveys specifically for clients, with a focus on reference data and enterprise data management, transaction technologies, market data and trading room infrastructure.

A-Team Group's research reports and surveys are available for FREE at:
www.a-teamgroup.com/research

profiles

Bank of America Merrill Lynch

Bank of America Merrill Lynch is a premier provider of sales and trading, clearing, financing, prime brokerage and research services worldwide. The Execution Services team is at the centre of the world's financial markets, delivering liquidity, timely insights, competitive pricing and added value to clients.

Global Execution Services is Bank of America Merrill Lynch's electronic trading and related services platform. Offering a full suite of leading multi-asset trading solutions, it is enhanced by the Firm's vast

global resources, access to superior liquidity, world-class technology and leading scale positions in capital markets. The range of offerings includes multi-asset class direct market access and the powerful algorithmic trading platform backed by 8 groups within Execution Services. Ongoing market microstructure research, robust underlying data and continued investment in development of real-time quantitative signals ensure algorithms provide superior execution quality in a changing marketplace.

Bank of America Merrill

Description of Algorithms

GetDone	BofA Merrill Lynch's most aggressive algorithm that completes orders quickly and efficiently via both dark pools and visible markets and works on both sides of the spread.
Ambush	Ambush is designed to intelligently locate liquidity and reacts quickly to stock movements. Ideal for less liquid stocks such as small and mid cap names.
BlockSeeker	Maximise block level crossing opportunities, by capturing both internal and external dark liquidity.
Instinct	Built around BofA Merrill Lynch's latest Dynamic Signals platform and extensive statistical libraries, Instinct trades using implementation shortfall as a benchmark. It intelligently predicts and reacts to market movements, adapting its trading tactics and strategies according to liquidity and market conditions.
I/S	Uses market impact estimates to schedule and manage a trade in order to minimise implementation shortfall.
ETF-aX Algorithm	Advanced Solution for Trading ETFs (US only). Optimal ETF execution looks beyond the liquidity specific to the ETF itself.

Lynch offers clients additional tools and services to assist them in trading,

including a 24 hour / 6 day a week Execution Desk for DMA and Algorithmic

Markets

Australia	✓	Malaysia	✓
Austria	✓	Netherlands	✓
Belgium	✓	Norway	✓
Brazil	✓	Portugal	✓
Canada	✓	South Africa	✓
China	✓	South Korea	✓
Denmark	✓	Singapore	✓
Finland	✓	Spain	✓
France	✓	Sweden	✓
Germany	✓	Switzerland	✓
Greece	✓	Taiwan	✓
Hong Kong	✓	Thailand	✓
India	✓	United Arab Emirates	✓
Indonesia	✓	United Kingdom	✓
Italy	✓	United States	✓
Japan	✓		

Concepts

Enhanced Capabilities Bank of America Merrill Lynch works with its clients and internal traders to further develop their electronic trading capabilities.

Common Algorithms

POV	✓
VWAP	✓
TWAP	✓
QMOC	✓

Company

Bank of America Merrill Lynch

Department/Division

Global Markets

Service or Product

Execution Services

Launch Date

2004

Website

<http://ba.ml.com/ges/>

Claimed Feature(s)

- Global connectivity and routing.
- High speed, customisable, anonymous electronic trading.
- Centralised order flow across all client segments to maximize internal crossing.
- Low Latency Trading.
- Compatible with Commission Sharing offering.

Claimed Advantage(s)

- Access to extensive global data infrastructure and client-customized quantitative research.
- Customizable execution services to meet individual client needs.
- Superior client service and execution guidance.
- MLXN is one of the deepest and most diverse pools of liquidity.

Special Facilities

- High Frequency
- Smart Order Routing
- Customizable Algorithms
- MLXN Dark Pool

Asset Classes

- Equities
- Futures
- Options



A-TEAM Insight Events

Insights from world-class technology innovators

A-Team Insight Events

2011 Spring & Fall Conferences & Exhibitions

SAVE THESE DATES:



A-Team Insight Events combine A-Team's expertise in financial markets IT with thought leadership from world-class technology innovators and practical experience from financial market practitioners. In 2011, a quality constituency will once again gather for these focused events in **London** and **New York City**.

“As a trading guy, seeing the business world through the technology lens is critically important, and A-Team Insight Events offered important insights.” - **Simon Wilson-Taylor**, MD & Global Head of FICC eCommerce, UBS.

Please contact us for further information on **A-Team Insight Events** events in 2011:

- Conference participation: Pete Harris - pete@a-teamgroup.com.
- Sponsorship, breakout sessions and exhibit sales: Martyn Hodges - martyn.hodges@a-teamgroup.com.

www.a-teamgroup.com/insightevents

>> Trading. The teams are located in Tokyo, Hong Kong, London, New York and Chicago. They also have satellite execution desks in Sydney and Mumbai. In addition to that, the Global Execution Consultancy team assists clients with a state of the art transactional cost analysis offering. BofA Merrill Lynch can also send automated market alerts. These automated IB chats or emails alerts can be sent to notify traders on trade performance against various

benchmarks such as VWAP and Arrival Price.

Bank of America Merrill Lynch also offers high frequency capabilities that provide Direct Market Access and co-location services at all major market centres via ultra low latency, scalable technology, coupled with state-of-the-art pre- and post-trade risk management tools.

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Interfaces

4th Story	✓	Indata	✓	Peresys	✓
Advent	✓	InfoReach	✓	Portware	✓
Arctic Lake	✓	Instinet	✓	Proquote	✓
Bloomberg	✓	IRESS	✓	Radianz	✓
Charles River	✓	ITG	✓	Reuters	✓
Citi	✓	JP Morgan	✓	ROX	✓
ConvergEx	✓	Linedata Longview	✓	RTS	✓
Derivix	✓	LiquidPoint	✓	Savvis	✓
EasyTrade	✓	Liquidity Book	✓	Silexx Financial Systems	✓
Edge Specialist	✓	Mantara	✓	SpiderRock EXS	✓
ESP	✓	Marketcetera	✓	Sterling	✓
EZX	✓	Mixit	✓	SunGard Global Trading	✓
Fidessa LatentZero	✓	NYSE Euronext	✓	TAS	✓
FIX Flyer	✓	Options City	✓	Tethys Tech	✓
FlexTrade	✓	Orc	✓	TNS	✓
FTEN		Paladyne		Townsend Analytics	

Barclays Capital

Barclays Capital Equities offers clients the BARX Equities suite of algorithmic trading strategies, a

comprehensive set of customisable algorithms, from benchmark-driven to user-defined, including

Description of Algorithms

BARX Hydra	Maximises execution rates in dark pools and opportunistically executes on traditional markets. The strategy executes in both dark and lit venues, intelligently adjusting exposure in real-time whenever liquidity is discovered.
Rapid	Quickly executes order whenever liquidity is available. The strategy aggressively takes displayed and reserve liquidity any time stock is available within a certain range of the arrival price; posts in dark venues when price moves away from its threshold.
Escalate	Adjusts aggressiveness dynamically, based on price. The strategy participates at a target percentage of market volume, scaling up aggressiveness as the market moves in your favour relative to the arrival price.
Relative Value	Automatically executes paired buy and sell orders in relative value trades. The user specifies the deal terms, target spread and execution method. The strategy monitors the market spread in real time and triggers a pair order when the current spread is in the target range.
Portfolio Target Strike	Minimises implementation shortfall at the portfolio level. The strategy dynamically updates its optimal trade schedule to balance price risk against price impact, subject to user-specified long-short neutrality constraints and aggressiveness level.
Custom Algorithms	Clients can create custom execution strategies using a combination of triggers based on real-time market data and actions consisting of our suite of algorithms and trading tactics. Clients can enhance existing strategies like VWAP or With Volume or create completely new, hybrid strategies.
Work and Pounce	Enhances benchmark-driven algorithms and trading tactics with opportunistic liquidity capture at a user-specified size and spread range.
Volatility Trader (Options)	Volatility Trader is a multi-functional execution tool for sophisticated options traders. The strategy allows traders to specify implied volatility and delta-adjusted limit prices, as well as stock and liquidity parameters for customizing the strategy's participation in the markets. The algorithm can also automatically hedge the options to maintain you desired delta exposure.
Options Work and Pounce	Options Work and Pounce is a tactical strategy that continuously monitors the aggregate size of all options exchanges for liquidity opportunities. The strategy allows traders to peg to the passive side of the market seeking price improvement or to remain completely hidden while waiting for liquidity to become available.

non-displayed liquidity-seeking algorithms. In addition, Barclays Capital offers a full suite of electronic execution tools for options, which includes standard,

dynamic and volatility-based algorithms.

Our equities and options algorithms are complemented by end-to-end

Interfaces

Advent	✓
Autex	✓
Belzberg	✓
Bloomberg	✓
Charles River	✓
Citi	✓
Convergex	✓
Derivix	✓
Fidessa LatentZero	✓
Flextrade	✓
InfoReach	✓
Instinet	✓
ITG	✓
JP Morgan	✓
Linedata Longview	✓
Metabit	✓
Minerva	✓
Mixit	✓
NYSE Technologies	✓
Portal	✓
Portware	✓
Quick	✓
REDI	✓
SunGard Global Trading	✓
Thomson Reuters	✓
Tora	✓
TradePipe	✓
Trading Screen	✓
UNIX	✓

Company

Barclays Capital

Department/Division

Equities, Electronic Trading

Service or Product

BARX® Equities Algorithmic Trading Strategies

Website

www.barclayscapital.com

Claimed Feature(s)

- Dynamically adaptive algorithms covering all market capitalization categories.
- Precise optimization basis for all algo decisions.

Claimed Advantage(s)

- Globally consistent product line covering US, European and Asian markets.
- Platform supported by state-of-the-art high-frequency econometric models for optimal forecasting.

Special Facilities

- Portfolio WebBench® Live – web-based real-time execution monitoring.
- LX® Liquidity Cross.
- Dynamic smart order routing

Asset Classes

- Equities • Options

Contact

Americas

+1 212 526 1130

EMEA

+44 (0)7773 8500

Asia Pacific

+813 4530 2263

>>

Markets		Common Algorithms	
Australia	✓	Implementation Shortfall	✓
Austria	✓	Target Close	✓
Belgium	✓	With Volume	✓
Canada	✓	TWAP	✓
Czech Republic	✓	VWAP	✓
Denmark	✓		
Finland	✓	electronic trading solutions including Smart Router, our dynamic smart order router; LX Liquidity Cross, our ATS; and Portfolio WebBench, our pre-, intra- and post-trade analytics application. We support our comprehensive offering of trading solutions with world-class client service to ensure we are accessing, aggregating, and analysing liquidity in the most intelligent and efficient way for our clients. The Electronic Sales Trading team works closely with clients to help them maintain a competitive edge. All of Barclays Capital's equities algorithms already have anti-gaming functionality, from simple randomisation of order placement, to in-depth statistical analysis of trade performance in each execution venue. In addition, our team evaluates the	
France	✓		
Germany	✓		
Greece	✓		
Hong Kong	✓		
Hungary	✓		
India	✓		
Ireland	✓		
Italy	✓		
Japan	✓		
Korea	✓		
Netherlands	✓		
New Zealand	✓		
Norway	✓		
Poland	✓		
Portugal	✓		
Singapore	✓		
South Africa	✓		
Spain	✓		
Sweden	✓		
Switzerland	✓		
Taiwan	✓		
U.K.	✓		
U.S.	✓		

nature of liquidity in various markets, produces execution quality reports on different venues and investigates any signs of information leakage on orders. For executions within LX, the team provides comprehensive reports on the quality of execution and fill rates.

A key differentiator of our client-centric model is our use of custom analytics studies to help improve a client's alpha generation. By leveraging our proprietary trading analytics tools, we can recommend enhanced custom trading strategies, based on an analysis of a client's past trading performance and future objectives, in order to help them achieve best execution.

Bloomberg Tradebook is Bloomberg's agency broker that partners with both the buy-side and sell-side to provide high-quality liquidity, market insight, and customised solutions based on innovative technologies. Founded in 1996, Tradebook offers its customer base trading solutions for equities, futures, options, and foreign exchange

(FX) to actively manage complex trading strategies in more than 70 global markets. We are a leading global agency broker that provides direct market access and a breadth of trading analytics and algorithms to institutional traders who seek maximum alpha on every market transaction.

Description of Algorithms

B-Smart	Intelligently posts your order out loud in the most active venues using dynamic real-time market information and proprietary probing results, seeking to maximize your exposure market sweeping. You control it by adjusting its Aggressive level.
FADE	Advanced Pegging strategy for global markets.
Global Block Hunter	Automatically scans the market and probes for hidden Reserve orders only trading if it knows it can get your size done.
Hammer	Seeks to buy/sell as much of the trader's size as possible without leaving a residual order.
Hide & Fire	Stealth strategy that sweeps market or nibbles at it when your price and size is there without posting. You control it by adjusting its Aggressive level.
Hide & Sweep	Stealth strategy that sweeps market when your price is displayed out loud without posting.
ICE	Strategy that enables trades to easily place a limit order with Reserve held at the exchange.
Leave-Some	Like TRIGGER in that it participates passively with the market and trades when blocks of stock are displayed, but will fire an order to buy/sell less stock that is displayed in order to "leave some stock behind."
TB IOC2LMT	Fires IOCs to the exchange taking as much stock as possible trader can leave a residual order with a user defined display for any unfilled balance.
TB LMT2MOC	Works a limit order in the market and will place any unfilled balance into the closing auction as a market-on-close order.
TRIGGER	Passive strategy that responds and trades when your size is there.

>>

Common Algorithms	
Arrival Price	✓
B-Dark	✓
B-Smart	✓
BWAP	✓
DWAP	✓
Global Portfolio Algo	✓
Go Along	✓
TWAP	✓
VIP	✓

We partner with clients to help them connect to high-quality liquidity, so clients can reduce the implicit costs of trading. Bloomberg Tradebook connects to more than 100 exchanges worldwide, across 41 countries, as well as 41 currency pairs. Bloomberg Tradebook provides access to 15 dark pools in the US along with dark pools in 16 global equity markets. Through this valuable market insight, clients can reduce the number of missed opportunities, as Bloomberg Tradebook provides consultative services

and tailored access to top third-party independent research. Bloomberg Tradebook also provides transparency into algorithms with real-time venue analytics, chart capabilities, and audit trails. In addition, Bloomberg Tradebook offers live execution support and guidance on electronic trading.

With Bloomberg Tradebook's customised solutions, clients can develop their own products to improve efficiencies and streamline workflow.

Markets					
Alpha ATS	✓	Finland	✓	Norway	✓
Australia	✓	France	✓	Poland	✓
Austria	✓	Germany	✓	Portugal	✓
BATS	✓	Greece	✓	Singapore	✓
BATS Europe	✓	Hong Kong	✓	South Africa	✓
Belgium	✓	Hungary	✓	South Korea	✓
Bermuda	✓	Ireland	✓	Spain	✓
Brazil	✓	Italy	✓	Sweden	✓
Canada	✓	Japan	✓	Switzerland	✓
Chi X	✓	Latvia	✓	SWX Europe	✓
Chi X Canada	✓	Malaysia	✓	Taiwan	✓
Cyprus	✓	Mexico	✓	Turkey	✓
Czech Republic	✓	NASDAQ OMX	✓	Turquoise	✓
Denmark	✓	Netherlands	✓	U.K.	✓
Estonia	✓	New Zealand	✓	U.S.	✓

Bloomberg Tradebook provides custom product development based on an evaluation of client needs. Bloomberg Tradebook's seamless workflow integration enables a trading strategy to be executed in fewer steps (Order API). Bloomberg Tradebook's powerful execution capabilities integrate directly with spreadsheets or desktops.

Finally, Bloomberg Tradebook leverages innovative technologies, so clients can increase their speed of execution. Bloomberg Tradebook has developed nearly 50 proprietary algorithms that

enable single-security, pair, spread, or program trading across multiple asset classes. Bloomberg Tradebook's smart order routing algorithm intelligently connects to fragmented liquidity around the globe.

Interfaces

Bloomberg	✓
Charles River	✓
ConvergEx	✓
ITG	✓
Linedata Longview	✓
Portware	✓
Prop OMS	✓

Concepts

Cross-Asset Pair Algorithm

Equity/Option Pair Trading Algorithm

Tradebook offers traders the ability to easily and quickly trade an options/equity pair while leveraging sophisticated technology to seek best execution for both contracts and shares.

Micro Algorithms

Blocks: BlockHunters algorithm seeks blocks of liquidity in both the dark and continuous markets
Discretion and Dark Pools: LiquidityHunters algorithm uses dynamic intelligence that seeks to find and extract hidden and discretionary liquidity in the dark and continuous markets
Reserve: Reserve Hunter algorithm uses dynamic intelligence seeks to detect the presence of Reserve

Company

Bloomberg Tradebook

Service or Product

Algorithms

Launch Date

1996

Number of Clients

10,000+

Website

www.bloombergtradebook.com

Claimed Feature(s)

- Advanced Customisable Execution Algorithms.
- Trade Analytics.
- Pairs Trading.
- Multi-Asset, one platform.
- Advanced Liquidity Aggregation and SOR technology for all global markets.
- Configurable algorithms.
- Leverages the Bloomberg Professional® Platform.

Claimed Advantage(s)

- High-Quality Liquidity.
- Valuable Market Insight.
- Customized Solutions.
- Innovative Trading Technologies.
- Independent Research.
- Flexible, Innovative Commission Management Services.

Special Facilities

- (SOAR) Smart Order Algorithmic Routing.
- Cross Asset Strategy Execution Algorithms.
- Multi-asset DMA and Benchmark Algorithmic Trading Strategies

Asset Classes

- Equities
- Futures
- Options
- FX
- Cross-Asset Algorithmic Strategies

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U.S.

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BNP Paribas

Global Execution Services (GES) is an integrated suite of trading services managed by BNP Paribas' Global

Equities & Commodities Derivatives division. GES offers global solutions for Voice, Electronic and

Description of Algorithms

Alpha	The Alpha algorithm provides equity traders with a proprietary multi factor model, allowing them to benefit from BNP Paribas' expertise in quantitative research. This algorithm uses the VWAP framework. Most of the value added comes from its use of theoretical 'fair values', updated in real-time throughout the day.
VolScaler	Designed to behave as a dynamic volume participation strategy. Algorithm monitors and adjusts the volume participation rate according to whether stock prices move above and/or below a pre-set threshold, expressed in percentage of deviation, versus a specific benchmark type – Strategy parameters allow to manage either mean reversion or market momentum situation.
HVol	Non-scheduled based strategy designed to target a percentage of the historical market volume - Strategy is typically used for shorter duration trades than VWAP as order is completed when the target participation is reached.
IcePeg	Allows investors to split orders into smaller portions, so that only a certain percentage of the entire order is displayed in the market. When adding PEG functionality, investors can decide to either track a limit price or current mid/bid/ask level.
Priority	The Priority Algorithm is designed for stocks with large minimum tick sizes. The order books of these stocks tend to be liquid at each tick so maintaining priority is essential.
Grab	To execute an order by taking advantage of all available liquidity in a timely manner. The Grab algorithm displays, if at all, some amount of the order in the market while waiting for an opportune time to cross the spread and capture liquidity.
Killer	Continuously removes lit and dark liquidity at or up to the strict "Killer" price using the SOR. Total order quantity is aggressively managed through IOC type while strategy never posts in the market and has no time out (unless specified) until order is completed.
TClose	The algorithm is designed to effectively manage the potential market impact of orders using the closing auction price as a benchmark – Strategy aims to consistently assess the portion to execute at and before the closing auction.
BuyBack	Designed for trading electronically whilst satisfying local regulations. It handles the transactions in accordance with regulations 2003/6/EC in Europe and SEC Rule 10b-18 in the US (Dealing Desk only).

Portfolio trading, supported by a cutting edge trading infrastructure, analytics and quantitative modeling derived from BNP Paribas long standing leadership in proprietary trading.

With key trading centres in London, Paris, New York, Tokyo Hong Kong and Singapore, BNP Paribas currently uses and distributes its 'BEATS' suite of algorithms (BNP Paribas Electronic & Algorithmic Trading Services) through the all of the most meaningful vendors trading platforms. It does so in conjunction with its proprietary smart order routing systems in

the US, Europe, and more recently Asia, catering for today's fragmented pockets of liquidity.

BNP Paribas's execution policy is designed for and foremost to provide liquidity to clients. Liquidity is sourced on all meaningful trading venues, our own desk, or the BNP Paribas Internal Exchange (BIX) dark pool, an industry veteran in operation since 2005. BNP large volumes of flow which accounts for very significant market share on venues like NYSE Euronext, Chi-X, Deutsche Boerse, the Tokyo, Hong Kong, or London Stock Exchanges. It is supported by a robust, high-throughput,

Interfaces	
Bloomberg	✓
BNY ConvergeX Eze OMS	✓
Charles River	✓
Citi	✓
ConvergeX	✓
ESP	✓
Fidessa LatentZero	✓
ITG	✓
LSE	✓
NYSE Technologies	✓
REDI	✓
Reuters	✓
SunGard Global Trading	✓
Tora	✓
TradeWare	✓
Trading Screen	✓

Concepts

Would	Takes the opportunity to partially or fully complete an order at a favourable specific price when running a VWAP, PVol or IS strategy.
IcePeg	Combines in one strategy both Iceberg and Peg functionalities.
Auctions	Innovative approach that allows a volume participation strategy to dynamically and accurately participate to the opening and closing auction by tracking the book building phase on a real time basis.
SOR Trading Strategies	(US Only) In the US, the SOR is the backbone of several dynamic algorithmic trading tactics Omega - Seeks displayed and reserve liquidity. Aggressive strategy designed for speed. Price March - Starts at the near side of the spread and exhausts liquidity at each price point before accessing the next price level. DARK - Accesses liquidity in dark pools only and never post displayed orders. DARK+ - Accesses liquidity via dark pools and utilizes ECN/Exchange non-displayed order types.

>>

low-latency trading platform, leveraging on the in-house High Frequency trading infrastructure developed for the proprietary trading team (while obviously being segregate).

BNP Paribas’ algorithms have originated from the Bank’s statistical arbitrage and portfolio trading activities. They have evolved over time, benefiting from years of client feedback and desk trading experience. BNP Paribas has developed sophisticated and innovative models through a wide variety of algorithms, including

benchmarks such as VWAP, TWAP, Volume Participation, but also through more complex ones such as Implementation Shortfall and ‘Dynamic tactics’. These continuously adjust their objectives and react instantaneously to arising market opportunities. For instance, the very convincing ‘Alpha’ algorithm uses a multi-factor model approach that dynamically estimates a stock’s short term theoretical return. More recently, BNP Paribas added several tactics which aggressively source and capture liquidity across lit and dark venues.

Markets					
Australia	✓	Hong Kong	✓	Poland	✓
Austria	✓	Hungary	✓	Portugal	✓
BATS Europe	✓	India	✓	Singapore	✓
Belgium	✓	Indonesia	✓	South Korea	✓
Brazil	✓	Ireland	✓	Spain	✓
Canada	✓	Israel	✓	Sweden	✓
Chi X	✓	Italy	✓	Switzerland	✓
China	✓	Japan	✓	Taiwan	✓
Czech Republic	✓	Malaysia	✓	Thailand	✓
Denmark	✓	Mexico	✓	Turquoise	✓
Finland	✓	Netherlands	✓	United Kingdom	✓
France	✓	New Zealand	✓	United States	✓
Germany	✓	Norway	✓		
Greece	✓	Pakistan	✓		

In the US, the SOR has access over 22 trading venues and is the backbone of several dynamic algorithmic trading tactics. It utilises direct real-time feeds from exchanges, ECNs and ATSS for order placement as well as historical data for liquidity analysis including a powerful heat mapping, latency calculations and will soon have 10 seconds dynamic data screening. BNP Paribas is currently developing a process that is called 'Fee Optimizer' to route orders to the least expensive venue, meeting best execution obligations.

Globally, Algorithms are developed using a testing platform that allows replay in the markets and backtest models to assess performance under certain conditions. The Bank also measures the performance of its algorithms on a post-trade basis and provides tailored reports back to clients.

Common Algorithms

VWAP	✓
TWAP	✓
Volume Participation	✓
Implementation Shortfall	✓
Market on Close	✓

Company

BNP Paribas

Department/Division

Global Execution Services (GES)

Service or Product

BNP Paribas Electronic & Algorithmic Trading Services (BEATS)

Launch Date

2003

Website

www.primebroker.com/global-execution.htm

Claimed Feature(s)

- Dedicated advisory and support desk.
- Low market impact and consistency in trading process.
- Optimized trading costs through the use of Smart Order Router and internal crossing network (BIX).
- Strong Best execution policies with fully available audit trail.

Claimed Advantage(s)

- Efficient pre and post trade analysis tools, with comprehensive analytics and quant modeling.
- Significant market share on most worldwide exchanges.
- Robust infrastructure.
- Straightforward and standardized instructions delivering powerful controls over the trading platform.
- Leading provider of global portfolio trading services.

Special Facilities

- DMA
- Smart Order Routing
- Internal Dark Pool (BIX)

Asset Classes

- Equities

Contact

Asia

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Singapore +65 6210 1917

Europe

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Paris +33 1 40 14 52 69

North America

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BNY ConvergEx

ConvergEx Group, a global technology firm, specialises in providing investment technologies and execution solutions to asset managers and financial intermediaries globally. With interfaces to more than 100 global markets (65 available

for algorithmic trading), it provides a variety of services across asset classes, including equities, fixed income, US-listed options, ADRs/GDRs and ETFs. These range from algorithms for execution to ConvergEx's own dark pools, VortEx and

Description of Algorithms

Abraxas	Dynamically balances orders among the most desirable market venues to efficiently access numerous sources of displayed and dark liquidity with minimal information leakage. Features a comprehensive, multi-dimensional sensitivity profile that simultaneously measures five essential market signals for each order.
ADR Plus	Uses patented technology to optimally source liquidity for ADR trades in both the overseas and US markets by dynamically monitoring liquidity and price. Provides clients with access to deeper liquidity pools and the ability to execute overseas without having to manage the ADR conversion process.
ConvergEx Cross	Sends resting orders to ConvergEx Cross. Lets user specify minimum cross quantity. Provides an option for clean up trade after successful cross as well as open market trading.
Darkest	Advanced order type that accesses global hidden order types and dark pools. It dynamically rebalances between dark markets as executions occur.
Grey	Passively participates in displayed markets and dark pools simultaneously.
Initiation Price	Aims to minimize movement away from the initiation/arrival price. User indicates market impact tolerance by specifying target participation rate. However, since completion is guaranteed, the algorithm may exceed the implied aggression level.
IQx	Provides optimal arrival price performance for small orders. IQx reads market trading activity and dynamically manages its trading tactics across both light and dark markets. ConvergEx optimizes the configuration of IQx for each customer individually.
Pulse	Locates and targets liquidity across all options exchanges and aggressively persists orders to take available liquidity. Systematically strips away liquidity at multiple price levels without getting caught in linkage.
Hidden	Conceals options orders from the marketplace while working them across all or a user-specified set of exchanges. When sufficient liquidity is displayed at the user's desired price, HIDDEN will 'snap up' the displayed liquidity and remain concealed until the order is filled.
Reserve	Breaks large options orders into user-specified displayed and un-displayed portions. The displayed portion can be worked on a single exchange or sliced to work across all exchanges. The un-displayed portion of the order is concealed from the marketplace and is used to replenish the displayed orders as required.

Millennium; optimisation tools for decision making (IQx); strategies for options and customised services.

ConvergEx has developed its core algorithms from the ground up focusing on global applicability, rather than developing an algorithm for a particular region and 'adapting' it to other markets. The firm not only cites such regional nuances as opening and closing functions for doing so but others as well – including how lunch breaks affect local trading patterns.

ConvergEx provides a range

Common Algorithms

Initiation Price	✓
Closing Price	✓
Percent of Volume	✓
TWAP	✓
VWAP	✓

Concepts

I Would Price	All of the above algorithmic strategies offer a unique "I Would Price" option. If the market moves favourably and some stock becomes available at the user specified "I Would Price", the algorithm will take as much liquidity as possible at that price, completing the order if size permits. When the price moves away from the "I Would Price", the algorithm will revert back to the original strategy for the remaining order quantity until the order is complete.
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of typical algorithms – VWAP, TWAP, POV for example but also its own algorithms

Interfaces

Advent	✓
AFA	✓
Bloomberg	✓
Charles River	✓
Citi	✓
ConvergEx	✓
EZX	✓
Fidessa LatentZero	✓
Flex Trader	✓
REDI	✓
HTx	✓
InData	✓
ITG	✓
JP Morgan	✓
Linedata Longview	✓
Mantara	✓
Mixit	✓
Portware	✓
Trading Screen	✓

Company

ConvergEx Group

Department/Division

Global Electronic Trading

Service or Product

ConvergEx Global Algorithmic Suite

Launch Date

2006

Website

www.convergex.com

Claimed Feature(s)

- Dynamic order rebalancing in advanced DMA tools.
- Provide clients with customized algos on request.
- Improve performance.
- Innovative execution strategies.

Claimed Advantage(s)

- 'I Would' feature.
- Multi-asset class trading in over 100 markets; agency model.
- Ability to tilt volume on benchmark strategies.
- Ability to modify tracking of the algorithm between max Alpha and Strict tracking.
- Connect to over 20 dark pools.

Special Facilities

- VortEx & Millennium (dark pools)
- IQx (intelligent execution logic)
- Sonic (Equities EMS)
- DerivatEx (U.S.-listed options EMS)
- Perform-Ex (transaction/performance analysis)
- TactEx (advanced DMA order types)
- ConvergEx Cross (crossing network)
- ConvergEx Suite of Advanced Algorithms

Asset Classes

- Equities
- Options
- Fixed Income
- ADRs/GDRs
- ETFs

What makes Risk-Technology.net different?

Much has been written about managing risk from a strategic and operational level as a result of the fallout from the credit crunch. But until now there has been no information resource dedicated to how technology can and is being used to help improve risk management. That's our speciality and what makes Risk-Technology different!

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>> all with customised features including aggressiveness, time sensitivity, venues of interest or avoidance, and its own “I would” price definition, which can override algorithm operation if the client’s target price is met. Many other parameters of its core algorithms are configurable by the user and

custom algorithms can be created. ConvergeX sees the most utilisation (roughly 70%) from the common benchmark algorithms – initiation price, VWAP, TWAP and market on close. About 30% of its users require tailored algorithms or more sophisticated algorithms, including IQx and Abraxas.

Markets

Australia	✓	Italy	✓
Austria	✓	Japan	✓
Belgium	✓	Latvia	✓
Brazil	✓	Malaysia	✓
Canada	✓	Mexico	✓
China	✓	Netherlands	✓
Cyprus	✓	New Zealand	✓
Czech Republic	✓	Norway	✓
Denmark	✓	Poland	✓
Dubai	✓	Portugal	✓
Estonia	✓	Romania	✓
Finland	✓	Singapore	✓
France	✓	South Africa	✓
Germany	✓	South Korea	✓
Greece	✓	Spain	✓
Hong Kong	✓	Sweden	✓
Hungary	✓	Switzerland	✓
India	✓	Thailand	✓
Indonesia	✓	Turkey	✓
Ireland	✓	United Kingdom	✓
Israel	✓	United States	✓

Contact

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U.S.

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CA Cheuvreux

Part of the Credit Agricole Group, CA Cheuvreux is the first pure-agency European equity broker. Its historical, multi-local* model positions CA Cheuvreux as a cutting edge outperformance provider for its 1,200 Institutional Investor clients.

It offers extensive, high value-added services in Research, Sales and Execution. With 90 analysts and economists, and an unparalleled coverage of 700 stocks, CA Cheuvreux is continuously ranked in the Top 5*** for European Country research and Top

Concepts

Fully Independent Quantitative Consultancy

Description of Algorithms

Crossfire	Dark pool aggregator.
Pounce	Monitors tape and rapidly triggers favourable price opportunities using a robust, short term pricing model (US Only).
Hunt	Takes volume at limit or better showing nothing.
Iceberg	Places passive orders on the book and reloads when a given slice is totally filled.

Markets

Austria	✓	Ireland	✓	Smartpool	✓
BATS Trading	✓	Italy	✓	Spain	✓
Belgium	✓	ITG POSIT	✓	South Africa	✓
Canada	✓	Knight Link	✓	Sweden	✓
Chi-X	✓	Liquidnet H2O	✓	Switzerland	✓
Denmark	✓	Mexico	✓	SWX Europe	✓
Finland	✓	Netherlands	✓	Turkey	✓
France	✓	Norway	✓	Turquoise	✓
Germany	✓	NYSE Arca Europe	✓	United Kingdom	✓
Greece	✓	Poland	✓	United States	✓
Hungary	✓	Portugal	✓	Xetra Mid-Point	✓

3** European Corporate Access provider.

CA Cheuvreux provides extensive market access to 100 execution platforms worldwide including all major MTFs and Dark Pools. Ranked No. 1** in Sales Trading Client

Service, CA Cheuvreux's execution specialists offer a wide spectrum of first-class products. CA Cheuvreux's algorithmic strategies, including quantitative models like VWAP and Implementation Shortfall, are developed by an in-house group of quantitative

Interfaces

Bloomberg	✓
BT Radianz	✓
Charles River	✓
ConvergEx	✓
Fidessa LatentZero	✓
FlexLink	✓
Flextrade	✓
Inforeach	✓
ITG	✓
Linedata Longview	✓
Portware	✓
REDI	✓
Reuters	✓
RTS	✓
SunGard Global Trading	✓
Tethys	✓
Tradeware	✓
TNS	✓
TradeWeb	✓
Tradebase	✓
Trading Screen	✓
Ullink	✓

Company

Credit Agricole Cheuvreux

Department/Division

Alternative Execution Services

Service or Product

CA Cheuvreux Algorithmic Trading Strategies

Launch Date

2000

Number of Clients

200+

Website

www.cheuvreux.com

Claimed Feature(s)

- Efficient and Flexible – CA Cheuvreux's algorithms are designed to react like traders.
- Ongoing adaptation - Amending trading models to reflect market structures and clients specific needs.
- Total Anonymity - Agency only broker execution.
- Accessible - Available through a wide range (30+) of OMS & EMS front ends.
- Diverse - 13 Global Strategies (European & American time zones).
- Global Market Access - Fully lit and dark Multi-venue enabled, Index independent.

Claimed Advantage(s)

- TCA & Execution analysis reports.
- Dedicated support and Execution Consultancy desk.
- Fully customisable (experienced traders, IT engineers and quant analysts to develop in-house systems and models).
- Quantitative Consultancy from fully independent Quant analysts.
- Diversified flow from institutional investors, agency brokers, retail and private banks

Special Facilities

- Straight Through Processing (STP)
- Smart Order Routing
- Blink Crossing Engine
- Online Real-time performance monitoring tool

Asset Classes

- Equities

Introducing

A-TEAM INSIGHT

Electronic Trading Market Data Insight Low Latency Reference Data Review Risk-Technology.net



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>> analysts. The company also operates a pairs trading engine that can be tailored to fit with clients' strategies and ever increasingly complex requirements. Its algorithms can all be customised and combined to specific investor behaviour, risk profile and trading styles.

CA Cheuvreux's algorithms fall into two main categories: Benchmark and Liquidity Seeker. 'Benchmark' algorithms (VWAP, Implementation Shortfall, Percent of Volume, Target Close, TWAP, InLine) are better suited for 'longer' duration orders (from 30 minutes to one day, depending on the liquidity of the traded stock), because they control the execution

rate. Conversely, the shorter term 'Liquidity Seekers' (CrossFire, Hunt, Iceberg) can execute 100% of an order very rapidly if market conditions are compatible with the order parameters.

**CA Cheuvreux has 14 offices worldwide: Amsterdam, Athens, Frankfurt, Istanbul, London, Madrid, Milan, Paris, Stockholm, Vienna, Zurich, New York, San Francisco, Tokyo.*

*** Thomson Extel 2010*

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Common Algorithms

Implementation Shortfall	✓
In Line	✓
Percent of Volume	✓
Sliding Volume Percentage	✓
Target Close/MOC	✓
TWAP	✓
VWAP	✓

Citi

Citi Electronic Execution is committed to providing with market-leading trading solutions that fully integrate with clients' chosen execution platforms. Citi's direct access and state-of-the-art suite of algorithms combine with an emphasis on service and analytics that empower clients to take full advantage of the equity markets.

Citi offers clients the same flexible algorithmic suite

Description of Algorithms

Citi Match	Citi Match is our proprietary internal crossing network. Only Institutional clients can rest orders in Citi Match. Citi Match has anonymous access to a broad universe of non-displayed retail, institutional, principal and broker-dealer liquidity. Citi Match is a secure trading venue offering sophisticated anti-gaming technology, protecting all participants.
Dagger	Citi's Dagger algorithm is designed to trade opportunistically. It is engineered to capture the optimal amount of available liquidity across all light and dark venues while minimising market impact and signalling risk. The aggression level parameter can be used to adjust the execution rate and market impact. Ranging from aggression level 1 through to 5, 1 being most passive and 5 being most aggressive.
Participate with Scaling	Citi's Participate with Scaling algorithm is engineered to capture a percentage of volume executed in the market. The target participation rate can be set to adjust dynamically based on the price of the underlying security. The opportunistic parameter can be used to take advantage of hidden liquidity using Citi Match and external dark pools.
Close	Smart Market on Close is an extremely flexible algorithm designed to cover all potential strategies that target the closing price. If liquidity necessitates, the algorithm can start trading early to minimize impact
Smart Iceberg	Replicated exchange iceberg functionality using Citi's Smart Order Router, participating aggressively and passively on multiple venues.
Smart Pegging	Passively tracks price movement of the security
TWAP	Spread trade evenly over a fixed time period.
VWAP	Follow average volume profile, minimize impact.
Implementation Shortfall	IS uses Citi's proprietary impact model to manage the trade off between impact and opportunity costs quantitatively. The opportunistic parameter can be used to participating in a number of dark pools to trade more quickly with low impact cost.

that was developed for its own equity trading team. Citi's algorithms, through which billions of dollars are executed daily, have a track record of high performance and infrastructure stability. With an understanding of local market nuances, Citi's teams of regional experts ensure its algorithms are developed and continually optimised.

Citi's aim is to work with clients to ensure they get the most out of its trading strategies. Its transparent approach gives customers the understanding, skills and confidence to fully utilize Citi's suite of market access products with maximum benefit.

At Citi Global Electronic Markets, we partner with our clients, helping to

Concepts

Multi-Asset capabilities Citi is focused on developing multi-asset capabilities and trading solutions.

Interfaces

Advent	✓
Bloomberg	✓
ConvergEx	✓
Charles River	✓
Fidessa LatentZero	✓
FlexTrade	✓
IRESS	✓
ITG	✓
Linedata Longview	✓
Portware	✓
Reuters	✓
SunGard Global Trading	✓
Tora	✓
Trading Screen	✓

Company

Citigroup

Department/Division

Citi Global Electronic Markets

Service or Product

Citi Match, Direct Market Access & Algorithmic Trading

Website

www.citigroup.com

Claimed Feature(s)

- Each of Citi's algorithms has unique access to Citi's global liquidity via Citi Match, Citi's award-winning internal crossing network that provides unmatched price improvement and the ability to trade at, or better than, the then-current NBBO, in a secure trading venue with sophisticated anti-gaming technology in place to protect all participants.
- Global Direct Market Access offers self-directed access to 32 markets and uses sophisticated order types and features to optimally source the best price across multiple trading venues. Order types dynamically access both hidden and visible liquidity and include Sweep, LavalMarket and Probe.
- Proprietary algorithmic trading strategies are connected to most major markets around the world. Citi's comprehensive suite of smart algorithms cater to a variety of execution styles and objectives, ranging from traditional benchmark tracking algos to dynamic algos designed to maximize liquidity capture across displayed and non-displayed venues. All algos are fully customizable.
- Our teams of regional experts continually work to develop new strategies and provide access to more trading venues.
- Smart Order Routing provides access to all relevant venues, optimized liquidity capture, use of native and synthetic order types, real-time fill rates that determine dynamic posting logic and SOR logic used by all algos to ensure optimal liquidity sourcing.

Claimed Advantage(s)

- Price improvement, trading without impact and protection by the most advanced anti-gaming technology

>>

from Citi Match. • You will be in full control of your order flow with a fully integrated technological solution that is fast and dependable. • Provides a direct link between you and the markets. • Our global suite of algorithms consists of nine core trading strategies and an extensive parameter set.

Special Facilities

- DMA • Smart Order Routing

Asset Classes

- Equities • Futures • Options • Foreign Exchange

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give them more control of today's complex, fluid markets by bringing together extraordinary market depth and intelligence with global execution expertise and continuous innovation. Our unique, proactive understanding of our clients' concerns, together with our success at addressing these effectively, is at the forefront of our mission to become the leading industry choice for global execution, innovative investment technology, knowledge resource and savvy market expertise.

We are passionate about providing end-to-end, market-leading trading solutions to help our clients

achieve their execution objectives as effectively and cost efficiently as possible. Our advanced, flexible products combine with an exceptional level of service, analytics and creativity to help clients take full advantage of the global equities marketplace.

Common Algorithms

Implementation Shortfall	✓
Market On Close	✓
Market on Open - Asia Only	✓
Participate with Scaling	✓
TWAP	✓
VWAP	✓

Markets					
Australia	✓	Hong Kong	✓	Singapore	✓
Austria	✓	Hungary	✓	South Africa	✓
Belgium	✓	Ireland	✓	South Korea	✓
Brazil	✓	Italy	✓	Spain	✓
Canada	✓	Japan	✓	Sweden	✓
Czech Republic	✓	Malaysia	✓	Switzerland (Non Virt-X)	✓
Denmark	✓	Mexico	✓	Switzerland (Virt-X)	✓
Finland	✓	Netherlands	✓	Taiwan	✓
France	✓	Norway	✓	U.K.	✓
Germany	✓	Poland	✓	U.S.	✓
Greece	✓	Portugal	✓		

A-TEAM INSIGHT RESEARCH

The Waiting Game: Standards in Corporate Actions Processing

There has been some real action of late in the standards space for corporate actions. In the US, the SEC issued a requirement for corporations to report in XBRL, and the XBRL US organisation has announced a project with the DTCC and Swift to tie the standard into ISO 20022, all of which could optimistically see true corporate actions automation from issuer to investor.

However, while this action is laudable, it is not a global initiative as the issuer reporting in the XBRL standard is limited to the US, so how will this benefit Europe and what progress is being made there? Not to mention that the take up of the original ISO 15022 standard has not set the world alight, with still only 20% of messages on the Swift network in 2009 being in the standard format.



The picture has been blurred with confusion in the market about just how ISO 20022 improves on ISO 15022 and what the real benefits are of adopting it. With Swift resolving not to force a 'big bang' migration to 20022 and putting more emphasis on the coexistence of the multitude of standards out there, what does the future hold for corporate actions messaging? How is ISO 15022 now faring? What do financial institutions think of ISO 20022? Is the take up of standardised corporate actions messages still increasing, or is there a real wait and see attitude while 20022 progresses? Do firms think the XBRL initiative and the tie up with DTCC and Swift will benefit them?

A-Team Group, a news, research and events company specialising in financial information technology, was commissioned by corporate actions software specialist SmartStream to interview a range of financial institutions to gauge the sentiment on these and other related issues. This white paper shares the results of that research.

Download this special report for FREE now!
www.a-teamgroup.com/rdr-research

Interested in participating in the series? **Contact:** martyn.hodges@a-teamgroup.com

Credit Suisse

Credit Suisse's Advanced Execution Services (AES) group helps more than 1,000 institutions and hedge funds reduce market impact, improve performance versus benchmarks, and add

consistency to their trading processes. AES offers an award-winning suite of algorithmic trading strategies, tools, and analytics for global trading.

AES has evolved into a

Description of Algorithms

Sniper	Equities, Options, Futures, FX - Trades proactively up to your limit without showing bids or offers.
Guerrilla	Equities, Futures, FX - Employs the AES Fair Value model to minimise market impact without displaying bids or offers.
In-Line	Equities, Futures - Seeks to minimise implementation shortfall against the arrival price, increasing participation when the price is favourable.
TEX	Equities - Seeks to minimise implementation shortfall against the market adjusted fair value price.
Volume Inline	Equities - Works the order in line with the volume.
Pathfinder	Equities, Options, Futures - Intelligently smart order routes to all available liquidity venues.
Close	Equities - Intelligently works orders into the close to minimise market impact.
Float	Equities, Futures, FX - Pegs the order to the mid, bid or offer with or without a display quantity.
Crossfinder Plus	Equities - Places your order into multiple dark pools.
Customizations	Equities - Design your own strategy or combine tactics to satisfy individual traders' requirements.
Delta-Adjusted	Options - Links the option limit price to the underlying spot price, adjusting it linearly based on user-specified order parameters.
Vol	Options - Similar to Delta- Adjusted, but with limit price adjustments based on implied volatility
Decoy	Options - Seeks liquidity at a better price than what is displayed
Recon	Options - Attracts liquidity.
Multi-leg	Options - A variety of multi-leg orders executed with or without leg risk to hedge, trade multiple expirations and strike prices, or execute spread trades.

full-service offering across equities, options, futures, and foreign exchange. With access to hundreds of trading destinations in over 40 countries on 6 continents, a single connection from your trading desk to AES gets you access to the world. AES has coverage desks and

Common Algorithms

Iceberg	✓
Implementation Shortfall	✓
Pairs	✓
Peg	✓
Percent of Volume	✓
Target Close	✓
TWAP	✓
VWAP	✓

Markets

Australia	✓	Japan	✓
Austria	✓	Korea	✓
Belgium	✓	Malaysia	✓
Brazil	✓	Mexico	✓
Canada	✓	Netherlands	✓
China	✓	New Zealand	✓
Czech Republic	✓	Norway	✓
Denmark	✓	Philippines	✓
Dubai and Abu Dhabi	✓	Poland	✓
Egypt	✓	Portugal	✓
Finland	✓	Singapore	✓
France	✓	South Africa	✓
Germany	✓	Spain	✓
Greece	✓	Sweden	✓
Hong Kong	✓	Switzerland	✓
Hungary	✓	Taiwan	✓
India	✓	Thailand	✓
Indonesia	✓	Turkey	✓
Ireland	✓	United Kingdom	✓
Israel	✓	United States	✓
Italy	✓		

Company

Credit Suisse Group AG

Department/Division

Investment Banking

Service or Product

Advanced Execution Services (AES)

Launch Date

2001

Website

www.credit-suisse.com/investment_banking/equities/en/aes.jsp

Claimed Feature(s)

- Total anonymity.
- Top tier team researching new strategies and analyzing the market.
- Multi-asset class product. Broad global reach: 6 continents. 40+ countries.
- Multi-venue with advanced SOR.
- Award winning.
- Easy access from a wide range of front end systems.
- Full customization of algos.
- Extensive TCA and reporting tools available across asset classes.
- Highly qualified, trading desks offering 24 hour, global support.

Claimed Advantage(s)

- Excellent client service.
- Sophisticated Low latency solution.
- Customizations to meet client needs.
- One of largest crossing pools, with high crossing rates.
- Improved execution performance.
- Reduced market impact.
- Protection with advanced anti-gaming strategies.
- Liquidity from a wide range of venues.
- Ensure clients have advanced offerings even as the market changes.

Special Facilities

- DMA
- High Frequency
- Internal Crossing
- Customizations
- Low Latency
- Advanced Smart Order Routing

Asset Classes

- Equities
- Futures (Commodities, Equity Indices, FI, FX)
- Options
- Foreign Exchange



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development teams in New York, London, Tokyo, and Hong Kong for round-the-clock coverage. With AES's tools, traders can seamlessly work orders on multiple liquidity pools, increase productivity and improve execution performance.

The platform has been consistently ranked as the

leader in global industry surveys.

Concepts

Spread / Pairs Trading

Gamma Trading

Delta-Hedging with options, with and without leg risk

Cross-border strategies

Interfaces

Advent	✓	Hydratrade	✓	Red Sky	✓
Aegissoft	✓	Indata	✓	Reuters	✓
AFA	✓	INDI	✓	Rox	✓
Antares	✓	InfoReach	✓	Royal Blue	✓
Apama	✓	Instinet	✓	RTex	✓
Arrowhead	✓	IRESS	✓	Simcorp	✓
Autex ATR	✓	ITG	✓	Sonic FT	✓
Bear Trade	✓	JP Morgan	✓	Sterling	✓
Beauchamp	✓	Knight-Direct	✓	SunGard Global Trading	✓
Beta	✓	Linedata Longview	✓	Tethys	✓
Bloomberg	✓	Mantis	✓	ThinkorSwim	✓
Bon-Trade	✓	MIXIT	✓	Thompson Open Trader	✓
Charles River	✓	Nexa	✓	Tick-TS	✓
Citi	✓	NYSE Technologies	✓	TLW	✓
Click Trade	✓	ORC	✓	Tora Trading	✓
ConvergEx	✓	Oxford	✓	Tradeplex	✓
ESP	✓	Palyadyne	✓	TradeSpeed	✓
EZX	✓	POMS	✓	TradeWare	✓
FastFill	✓	Portal	✓	Trading Screen	✓
Fidessa LatentZero	✓	Portware	✓	Upstream	✓
FIN	✓	Primetrade	✓	Verus Tech	✓
Flextrade	✓	Quest Trading	✓	WEX	✓
FutureTrade	✓	Radical (ITG)	✓		
HTX	✓	RBC	✓		

Daiwa Securities Electronic Trading (DSET) offers a full suite of products for self-trading clients, ranging from enhanced algorithmic trading strategies and crossing to margin DMA and ultra low latency collocation. A dedicated Electronic Sales Trading team works to help each client achieve the best execution possible, whatever the requirements.

Daiwa Algorithmic Trading (DART) is a full featured offering that encompasses all the industry standard algos

and also allows extensive customization to satisfy each client's needs. The algos have been purpose built for the Asian markets, and the benchmark algos such as VWAP and Active (IS) have been extensively tweaked to get the best possible execution in each market's vastly differing microstructure. The process of analysis and re-analysis is a continuous feedback loop – as the markets fluctuate and trading patterns change, the algos' behaviour changes with them. Extensive quant

Concepts

Asia Focused Offering

Description of Algorithms

Dynamic POV	Trades inline with market volume, scaling between the trader's two participation rates. Can choose either momentum (scale up when out of favour) and reversion (scale up when in favour).
Snipe	Takes some or all displayed liquidity depending on your desired aggressiveness; allows one to also intelligently post liquidity to earn the spread. Works very well for illiquid stocks where large spreads are the norm.
Iceberg	Post a piece of your order at a single price in order not to show your full hand.
Dark Iceberg	Post a piece of your Dark order at a price.
Pegging	Passively post liquidity at one or more depths simultaneously, pegging to the best bid or offer. Shows either the whole order or an automatically-sized piece to avoid impact.
Dark Pegging	Peg your Dark order to any of a number of intra-spread points in DIRECT.



research is dedicated to not only building the ideal schedule, but also to trading to that schedule efficiently, taking advantage of short term price and liquidity opportunities, always aiming for best execution.

DIRECT is Daiwa’s crossing platform. Daiwa’s very large market share, evenly balanced between foreign and domestic investors, creates the perfect environment within which to create natural crossing opportunities. DIRECT brings Daiwa’s flows into one place and by crossing off market gives clients price improvement, queue jumping, and reduced market impact, as well as the potential to execute large blocks anonymously. Orders can either be placed directly into DIRECT to participate only in the Dark, or if a client is enabled, all flows to the primary exchange can

automatically participate in DIRECT in parallel. DART’s suite of benchmark algos are enhanced to work seamlessly with DIRECT, seeking out liquidity and providing further crossing opportunities.

DSET’s latest co-location offering has a latency of sub-10 micro-seconds and can handle 100,000 orders/sec with a full suite of risk filters and high availability. This is a huge advantage considering that most broker offerings in Japan are at the hundreds-of-microseconds level.

DSET leverages Daiwa’s global network to bring access to local expertise and highly experienced sales and trading teams. Daiwa Capital Markets is consistently top-ranked in its home market of Japan. The firm offers top-of-class research, underwriting know-how, M&A expertise and capital market financing.

Common Algorithms	
Active (IS)	✓
Percent of Volume	✓
TWAP	✓
VWAP	✓

DSET offers full compatibility and integration with various versions of FIX and vendor/proprietary EMS/OMS platforms. A highly efficient straight-through-processing infrastructure gives seamless front-to-back operational support, and high availability and robust failover systems ensure reliable operation.

Markets

Australia	✓
Hong Kong	✓
India	✓
Indonesia	✓
Japan	✓
Korea	✓
Malaysia	✓
Singapore	✓
Taiwan	✓
U.S.	✓

Interfaces

Charles River Development	✓
ConvergEx	✓
Fidessa Latent Zero	✓
Flextrade	✓
Horizon	✓
InfoReach	✓
Instinet	✓
Iress	✓
ITG	✓
JP Morgan	✓
Metabit Systems	✓
Paladyne	✓
Portware	✓
Quick Co.	✓
SunGard Global Trading	✓
Tora Trading	✓
Tradeware	✓
Trading Screen	✓

Company

Daiwa Securities Capital Markets

Department/Division

Electronic Trading

Service or Product

Daiwa Securities Electronic Trading (DSET)

Launch Date

2007

Website

www.daiwacm.com

Claimed Feature(s)

- Ultra Low Latency.
- Dedicated Electronic Sales Trading team.
- Total anonymity.
- Client Customization

Claimed Advantage(s)

- Algos built FOR Asia IN Asia.
- Algos fully integrated with DRECT Dark Pool.

Special Facilities

- DRECT Dark Pool
- Collocation
- Smart & Margin DMA

Asset Classes

- Equities

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Deutsche Bank

Deutsche Bank's algorithmic trading platform, Autobahn Equity, combines the bank's algorithms with its direct market access (DMA)

offering. Autobahn Equity maintains offices in London, New York, Hong Kong, Tokyo and Sydney. Autobahn serves as Deutsche Bank's

Description of Algorithms

Super X	Super X's objective is to intelligently seek dark liquidity from multiple venues whilst offering a sophisticated level of order protection to clients. It is a highly customisable dark algorithm, the strategy can be finely tuned to the individual traders needs.
Optimal Portfolio Execution Strategy (OPX)	The OPX strategy's objective is to execute a portfolio transaction in such a way as to respect the user's preference between the market impact and the intra-day risk incurred during trading. In addition, a range of user-supplied constraints and other preferences are available to influence the behaviour of the strategy and reflect the user's views on risk. Finally, the user may specify his view on overall portfolio expected return as well as the expected return of some of its constituents, and the strategy will take this information into account in scheduling orders.
Stealth	Stealth is a "high take, low post" strategy which trades opportunistically while minimising information leakage. It will typically take liquidity when it is cheap to do so - spreads are usually narrow - or when the far-touch quote is unusually large. If liquidity posting is enabled, it will post in dark venues where possible and light venues very conservatively. Information leakage is minimised by using minimum execution thresholds where necessary in dark venues, and by posting in light venues only in a way that does not materially affect the shape of the order book.
Arrival Price	Arrival Price is a dynamic trading strategy designed to minimise the difference between the price at the time the order was entered and the execution price. It relies on price and liquidity signals to trade as efficiently as possible while controlling the incurred market impact. It provides an alternative approach to the classic Implementation Shortfall algorithm, in that it prioritises control of short term impact over control of risk.
Percentage of Volume	The Percentage of Volume Strategy offers clients the flexibility to control their participation level as a percentage of volume. Performance based variable participation and conditional behaviour will provide the trader with powerful tools to respond to market movements in favourable and predictable ways.
Smart Iceberg	The Smart Iceberg strategy will execute your order while only displaying a limited amount of the total order quantity. The strategy allows you to manage exchange specific iceberg order rules by creating synthetic order functionality.
Smart Peg	The Smart Peg strategy seeks to "peg" orders to a specified price level while displaying on the market only a limited amount of the total order at any time. The strategy evaluates the peg expression whenever the reference price changes and adjusts its position in the market accordingly.

e-commerce solution across multiple asset classes.

Deutsche Bank maintains a full suite of algorithmic strategies, including core strategies such as VWAP, TWAP, In-Line, Scaling, and Arrival Price amongst other strategies. All strategies include conditional parameters aimed at offering clients enhanced abilities to customize the algorithms according to their needs by offering the flexibility to choose “I Would” features relative to an absolute price or benchmark. As such, Deutsche Bank’s overall approach is aimed less at product proliferation but more on the ability to customize core strategies to suit individual clients’ execution needs. Meanwhile, the bank’s algorithms are certified for distribution via some 40 third-party vendor platforms.

Autobahn Equity describes its overall approach to electronic trading as low touch rather than no-touch. According to Edgar Harty, Head of Autobahn Equity Trading Europe, his team can be as interactive or hands-off as the client demands, depending on their requirements. The group counts a broad range of institutional types as customers, including hedge funds, long-only asset managers, and index managers. The bank’s algorithms are design by its Quantitative Products group using fundamental research and robust historical analytics combined with insightful customer feedback.

Common Algorithms

Implementation Shortfall	✓
Target Close	✓
TWAP	✓
VWAP	✓

Company

Deutsche Bank

Department/Division

Global Markets Equity

Service or Product

Autobahn Equity, Electronic Trading

Number of Clients

500+

Website

autobahn.db.com

Claimed Feature(s)

- Multi-asset, multi-product.
- Sophisticated execution tool-kit.
- Anonymous trading.
- Customized content and analytics.
- Easily integrated into existing workflows

Claimed Advantage(s)

- Leading market share in major markets.
- Customization available to suit individual client needs.
- Certified with 40+ third party vendor systems.
- Leading edge Smart Order Router (SOR).

Special Facilities

- Low Latency Expertise
- EMS/OMS integration
- Pre and Post trade analytics
- DMA & Algorithms

Asset Classes

- Equities

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>>

Markets		Interfaces	
Australia	✓	4th Story	✓
Austria	✓	AFA	✓
BATS	✓	Bloomberg	✓
(Europe & U.S.)		Charles River	✓
Brazil	✓	ConvergEx	✓
Canada	✓	ESP	✓
Chi X	✓	Fidessa LatentZero	✓
(Europe & Canada)		FlexTrade	✓
Dubai	✓	Global Topic	✓
Euronext	✓	InfoReach	✓
(France, Belgium, Netherlands, Portugal)		Instinet	✓
Germany	✓	Interactive Brokers	✓
Hong Kong	✓	ITG	✓
India	✓	JP Morgan	✓
Indonesia	✓	Linedata Longview	✓
Italy	✓	NRI Smartbridge	✓
Japan	✓	NYSE Technologies	✓
Norway	✓	Patriot	✓
OMX (Copenhagen, Helsinki, Stockholm)	✓	Portware	✓
Singapore	✓	Quick	✓
South Korea	✓	REDI	✓
Spain	✓	Reuters	✓
Switzerland	✓	Softek	✓
Taiwan	✓	SunGard Global Trading	✓
Thailand	✓	SWIFT	✓
Turquoise	✓	TAL Realtick	✓
U.K.	✓	TAS	✓
U.S.	✓	Tethys	✓
Virt-X	✓	Tora	✓
		TraderForce	✓
		TradeWare	✓
		Trading Screen	✓
		Ullink	✓
		Visual Trader	✓
		Wolverine	✓

Fidelity Capital Markets (FCM) is a customer-focused institutional trading firm operating under the Fidelity umbrella. The firm's goal is to integrate institutional, intermediary, and retail business and trading platforms, while maximising the synergies that exist among them. The resulting trading complex provides clients with a variety of solutions and products, backed by experience, that

address your needs. FCM offers products and services to assist with trading across all asset classes, creating a trading environment that puts the client's objectives first. FCM offers a number of unique trading solutions and analytics services that help measure the effectiveness of the trade process. FCM's Model Trade Execution (MTRX) service is designed to help meet clients' algorithmic trading

Description of Algorithms

DarkSweep

Enables clients to maximize execution without revealing their trading intentions with a sophisticated trading strategy that aggregates hidden liquidity into a single entry point. DarkSweep is a sophisticated algorithm that aggregates hidden liquidity from over 30 other ATSs into a single entry point. DarkSweep will only execute within the National Best Bid and Offer. Orders will be pegged to the midpoint or primary (depending on the venue), providing price improvement for your trade.

Snap – Implementation Shortfall; Arrival Price

SNAP optimizes the trade-off between market impact, liquidity, and time risk. Traders provide the SNAP strategy an 'urgency level' that fits their risk aversion to manage the pace of trading.

Adrenaline

Adrenaline will survey quoted venues in an attempt to identify significant levels of liquidity on the bid or offer while working a piece in DarkSweep. Once triggered by the bid/offer size exceeding the symbol-specific characteristics, Adrenaline will access liquidity based on Aggressiveness. Aggressiveness determines how sensitive Adrenaline is and how much of the quoted liquidity to attempt to take.

Recoil

Recoil looks for local price momentum while searching for liquidity in DarkSweep. Using symbol-specific characteristics, Recoil determines when favourable price points appear. When triggered, the algorithm begins intelligently interacting with liquidity from both dark and quoted venues.

T-Hawk

T-Hawk patrols for advantageous liquidity and price levels while representing your order in DarkSweep. The algorithm sources liquidity from dark and quoted markets when the opportunity presents itself.



needs. Designed by an experienced, in-house financial engineering team, MTRX provides optimal order placement and execution targeting a variety of benchmarks. MTRX empowers clients to operate more efficiently, using proprietary liquidity mapping

technology and trading networks to help minimize market impact, reduce trading costs, and improve the quality of execution. All algorithmic trading strategies leverage Fidelity’s broad liquidity reach and routing techniques via its smart order router, Fidelity Dynamic

Interfaces	
Advent	✓
AFA	✓
Bloomberg	✓
Charles River	✓
ConvergEx	✓
Fidessa LatentZero	✓
ITG	✓
JP Morgan	✓
NYSE Technologies	✓
REDI	✓
Sterling	✓
SunGard Global Trading	✓
TeamTrader	✓
Townsend Analytics	✓
Trader Console	✓
Common Algorithms	
Corporate Buyback	✓
Market On Close	✓
Target Price	✓
TVOL	✓
TWAP	✓
VWAP	✓

Liquidity Management (FDLM).

All of FCM's Liquidity Seeking Algorithms aim to source liquidity leveraging DarkSweep and an opportunistic model around price and size. As liquidity is sourced, the algorithms rebalance the allocation in

order to capture all available liquidity. The algorithms are designed to balance the anonymity of a trader's intentions and getting an order completed when favourable liquidity or price levels appear. None of the algorithms will post the order out loud.

Markets

Argentina	✓	Luxembourg	✓
Australia	✓	Malaysia	✓
Austria	✓	Mexico	✓
Belgium	✓	Netherlands	✓
Brazil	✓	Norway	✓
Canada	✓	Peru	✓
China	✓	Philippines	✓
Czech Republic	✓	Poland	✓
Denmark	✓	Portugal	✓
Estonia	✓	Russia	✓
Finland	✓	Singapore	✓
France	✓	South Africa	✓
Germany	✓	South Korea	✓
Greece	✓	Spain	✓
Hong Kong	✓	Sweden	✓
Hungary	✓	Switzerland	✓
Iceland	✓	Taiwan	✓
Indonesia	✓	Thailand	✓
Ireland	✓	Turkey	✓
Israel	✓	U.K.	✓
Italy	✓	U.S.	✓
Japan	✓		✓

Company

Fidelity Capital Markets

Department/Division

Electronic Trading

Service or Product

Algorithmic Strategies (MTRX - Model Trade Execution)

Website

www.fidelitycapitalmarkets.com

Claimed Feature(s)

- Dynamic scheduling and order placement capabilities helps minimize market impact and enhance execution quality.
- Single stock and basket trading strategies.

Claimed Advantage(s)

- Advanced liquidity mapping techniques.
- The most extensive liquidity network in the industry.

Special Facilities

- DMA _Pre and Post trade analytics
- Order Routing
- Fix Connectivity
- Anonymous Crossing Network

Asset Classes

- Equities
- Fixed Income
- Options
- FX

Contact

U.S.

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Goldman Sachs

Goldman Sachs Electronic Trading (GSET) offers a complete suite of global, multi-asset algorithms, covering Europe, North America and Asia. Goldman Sachs algorithms are utilised by a diverse client base, including institutional managers, pension funds and hedge funds, as well as broker dealers and other sell-side financial service providers. Additionally, Goldman Sachs' internal trading desks utilise its algorithmic suite for working customer business. Through the Sigma smart order router and suite of liquidity enhanced products for trading equities,

Description of Algorithms

Participate	Multi Product (Equities, Futures, Options, Synthetics) - Tracks a specified percentage of composite market volume.
TWAP	Multi Product (Equities, Futures, Options, Synthetics) - Minimizes deviation from the composite market time-weighted average price over the specified order horizon.
VWAP	Multi Product (Equities, Futures, Options, Synthetics) - Minimizes deviation from the composite market volume-weighted average price over the specified order horizon.
Dynamic Scaling	Equities - Tracks a dynamic percentage of composite market volume based on changes in stock price.
Custom Navigator	Equities - Leverages historical execution quality analytics to route to the most appropriate algorithm based on order and security analysis.
Port X	Equities - Minimizes implementation shortfall on a portfolio level by optimizing the trade-off between the portfolio's overall execution risk and market impact.
Relative Scaling	Equities - Tracks a dynamic percentage of composite market volume based on changes in security price relative to a benchmark index.
Sonar	Equities - Aggregates liquidity across multiple public and dark venues while mitigating adverse execution.
Sonar Dark	Equities - Aggregates liquidity across multiple dark venues while mitigating adverse execution.
Implementation Shortfall	Equities - Minimizes implementation shortfall by continuously optimizing the trade-off between execution risk and market impact.
Stealth	Equities - Captures all displayed and non-displayed liquidity up to the limit price without posting out loud to public markets. >>

clients benefit from next-generation algorithms, sophisticated crossing and anti-gaming logic, and a comprehensive suite of analytics.

Goldman Sachs was a pioneer in multi-asset algorithmic trading, which now encompasses a breadth of strategies: 13 equity algorithms, 12 futures algorithms, four synthetic algorithms, and nine options strategies. The equity algorithms are divided into four categories – benchmark matching, price and liquidity seeking, dynamic participation, and customized – and cover both single-stock and portfolio-level execution.

The core algorithms (VWAP, TWAP, and Participate) have all been enhanced to access ‘dark’ liquidity, giving users the ability to cross blocks in the dark as well as enabling them to minimise market impact and signalling risk via intelligent order placement across multiple liquidity venues.

A highlight of the GSET equity offering is Sonar, a

Common Algorithms

Implementation Shortfall	✓
Peg	✓
Percent of Volume	✓
TWAP	✓
VWAP	✓

Concepts

Sigma and Sigma X Sigma is Goldman Sachs’ Smart Order Router. Sigma X is Goldman Sachs’ Alternative Trading System (ATS) for US equities, and it is among the largest in the US. All equity algorithms leverage the Sigma routing logic and Sigma X liquidity.

Sigma X-Cross Sigma X-Cross is a portfolio and single stock point-in-time cross with constraints. Crossing opportunities are maximized as participants meet on all three trading dimensions – time, size, and price. Scheduled crosses occur daily at 10:30 am, 12 noon, and 2:30 pm, New York time, with the ability to add an ad-hoc cross intraday. All X-Cross matches are crossed at the midpoint, there is no time priority.

Company

Goldman Sachs

Department/Division

Electronic Trading

Service or Product

Goldman Sachs Electronic Trading
- Algorithmic Strategies

Launch Date

2002

Number of Clients

2000+

Website

www.gs.gset.com

Claimed Feature(s)

- Smart order routing and algorithmic trading across Asia, Europe, North and South America.
- REDIPlus EMS

Claimed Advantage(s)

- Superior execution quality.
- Liquidity reach.
- Execution consulting and customized solutions.
- Global multi-asset class offering.
- Ease of use.
- Anonymity.

Special Facilities

- Sigma and Sigma X liquidity products
- Smart Order Routing

Asset Classes

- Futures
- Equities
- Synthetics
- Options



liquidity-seeking algorithm that routes to both non displayed and public destinations, utilising smart order types to actively source liquidity at attractive price levels. Clients can also select a ‘dark-only’ strategy, Sonar Dark, allowing them to access non-displayed pools only. Another highlight is Port X, a portfolio-level algorithm designed specifically for clients who trade portfolios with an implementation shortfall benchmark. The algorithm calculates the optimal timeframe over which to trade a portfolio by taking into consideration the risks inherent in a basket, historical and real-time trade/market data as well as user-defined \$/ratio balancing and risk parameters. Finally, clients can take advantage of the Navigator customised trading solution. Based on a number of pre-defined, client-selected parameters,

Description of Algorithms (cont.)

Delta Adjusted	Options - Limits will float with the underlying security according to the option delta. To keep the delta relevant, the order will be temporarily suspended if it travels outside upper and lower bounds of the underlier set by the user. This order will scan the market until the order is marketable, and then sweep liquidity accordingly.
Prowler	Options - Sweeps markets quickly using IOCchild orders, taking all available liquidity within the order’s limit. Prowler will then sit on our servers, hidden from the rest of the market, waiting to strike when marketable again.
Smart Limit/Market Order	Options - Simultaneously sweeps the inside of each exchange until the order is no longer marketable, then will post on the appropriate exchange based on market factors.
Volatility Limit	Options - Allows the client to enter volatility, interest rate, and dividend assumptions that are translated into an explicit real-time limit order. . This order will scan the market until it is marketable, and then sweep liquidity accordingly.
Iceberg	Options - Posts tranches into the market while hiding the balance on our servers. Filled orders are replaced with subsequent tranches until the order is filled or cancelled. If the market moves into the limit, the order will aggressively take the liquidity by sweeping with IOC orders.
Synthetic Execution	Synthetics - Uses stock-specific cost estimates based on liquidity and pricing parameters to offer pretrade analysis for the optimal trading horizon. Allows for a range of aggressiveness in execution strategy. >>

Interfaces	
Advent	✓
Beauchamp	✓
Bloomberg	✓
Brass	✓
Charles River	✓
Citi	✓
ConvergEx	✓
ESP	✓
Fidessa LatentZero	✓
FlexTrade	✓
InfoReach	✓
Instinet	✓
ITG	✓
JP Morgan	✓
Linedata Longview	✓
MIXIT	✓
Patsystems	✓
Portware	✓
REDI	✓
Reuters	✓
RTS	✓
Sophis	✓
SunGard Global Trading	✓
Tradar	✓
Tradeware	✓
Trading Technologies X Trader	✓
TradingScreen	✓
UNX	✓
Triton (ITG)	✓
UNX	✓

Markets	
Australia	✓
Austria	✓
Belgium	✓
Brazil	✓
Canada	✓
Chi X	✓
Denmark	✓
EBS	✓
Finland	✓
France	✓
Frankfurt Xetra	✓
Germany	✓
Greece	✓
Hong Kong	✓
Ireland	✓
Italy	✓
Japan	✓
Korea	✓
Mexico	✓
Netherlands	✓
Norway	✓
Portugal	✓
Singapore	✓
South Africa	✓
Spain	✓
Sweden	✓
Switzerland	✓
Taiwan	✓
Turquoise	✓
United Kingdom	✓
United States	✓

Contact

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>>

Navigator acts as a filter that routes a customer's order flow to a range of specific Goldman Sachs algorithms, selecting the strategies to help our clients achieve best execution given the order characteristics, trading benchmark and short-, medium- or long-term alpha drift.

Description of Algorithms (cont.)

Auto Cancel	Futures – Cancels a live order at a future time defined by user,
IntelliSea	Synthetics - Pseudo-market order type for synthetics that attempts to execute an order as aggressively as possible, given sufficient liquidity.
Iceberg	Futures – Hides full order size from market by splitting total order quantity into smaller, displayed child orders.
Market-if-touched	Futures – A market buy (sell) order is sent when the instrument trades at or is offered at (bid for) the user-specified price or lower (higher).
OCO Stop Loss	Futures – Straddles the market by combining a stop order with a limit order. When one is elected, the other is cancelled.
Peg	Futures – Pegs a buy (sell) order to the best bid (offer). Additional settings allow user to customize frequency of repricing posted orders, quantity displayed, start/end time, and the concept of “completing” an order before the close.
Tick	Futures – Set price discretion (in ticks) to update with changes in posted bids and offers. Algorithm allows trader to increase (decrease) limit for a buy (sell) order based on changes in posted liquidity on opposite side of market.
Time Activation	Futures – Sets order to be released to exchange at a future time defined by user.
Time Slice	Futures – Breaks order into smaller pieces which are spread evenly over a user-defined time period. Additional settings allow user to tailor strategy for their desired level of customization and aggressiveness.

HSBC

HSBC operates a single-instance, globally replicated order management and trading platform providing execution access into 102 equity exchanges. This provides 24-hour coverage for all equity orders including weekends for the Middle East. We can accept FIX orders for Equities (Care & Block, PTA, DMA, DSA) as well as Futures (41 exchanges) and FX (100+ currency pairs) via a single connection.

HSBC has a policy of connecting to all commercially established order routing networks on a cross asset class basis. With the recent rebuild of its FIX network, each of HSBC's FIX connections is multi-asset class from inception, thus reducing the need to connect

multiple times to the same counterparty.

We are able to manage customers orders using any combination of manual and automated intervention the clients or the transaction may require. When using our eEquities Desks, all client orders are automatically segregated from other activities thus ensuring information about transactions is managed within a controlled environment utilising strict Chinese Walls. The eEquities team retain the option, upon a clients request to access liquidity from other client trading teams.

To help manage our best execution obligations HSBC has created and deployed a Consistent Tolerance Model

Description of Algorithms

Tiger

Dynamic Liquidity seeking algorithm, designed to trade opportunistically in the lit markets whilst taking advantage of dark liquidity. Best used when the trader is prepared to pay the spread and have some impact in order to extract liquidity whilst employing stealth order types and not showing the intention to the order book.

DynaPOV

Allows a trader to dynamically vary the participation rate as the stock moves relative to the chosen benchmark. The algorithm can react to both movements in absolute stock price as well as the stocks relative performance verses its sector or country index.

>>

(CTM) to help understand when any transaction may have caused a potential breach of our best execution policy, using a wide and comprehensive set of quantitative inputs. The bank's single global platform enables this monitoring across any order irrespective

of the regulatory regime it is executed within.

HSBC focuses on developing core automated trading strategies which address the issues faced by our trading counterparts in an increasingly fragmented market environment which

Interfaces			
AFA	✓	MIXIT	✓
Bloomberg	✓	NYSE Technologies	✓
Charles River	✓	Peresys	✓
CMA	✓	Portware	✓
ConvergEx	✓	Reuters	✓
Currenex	✓	RTS	✓
ESP	✓	Savvis	✓
EZX	✓	Saxo	✓
Fidessa LatentZero	✓	SS&C	✓
Fixcity	✓	SunGard Global Trading	✓
Flextrade	✓	Tethys	✓
Forex Manage	✓	TNS	✓
Fundworks	✓	Tora	✓
Gate Lab	✓	Townsend	✓
GSET Connect	✓	TradeWare	✓
InfoReach	✓	Tradeweb	✓
IRESS	✓	Trading Screen	✓
JP Morgan	✓	Trading Technologies	✓
Linedata Longview	✓	Ullink	✓
LSE	✓	UNX	✓
Metabit	✓		

includes a requirement to trade remotely on a fully contingent basis.

We also leverage our local market access and knowledge by providing execution capabilities across multiple Frontier Markets. With our extensive network of local Treasury teams we are able to provide single counterpart relationships and the best in local colour and market intelligence.

Concepts

DECS Direct Execution & Custody Services for wholesale electronic trading solutions into Developed & Emerging Markets

Common Algorithms

POV	✓
DynaPOV	✓
VWAP	✓
TWAP	✓
TIGER	✓
IS	✓
DRAGON	✓

Markets

Abu Dhabi	✓
Australia	✓
Austria	✓
Belgium	✓
Brazil	✓
Canada	✓
China	✓
Cyprus	✓
Denmark	✓
Dubai	✓
Finland	✓
France	✓
Germany	✓
Greece	✓
Hong Kong	✓
Israel	✓
Italy	✓
Japan (Tokyo/Osaka)	✓
Kuwait	✓
Netherlands	✓
Norway	✓
Poland	✓
Portugal	✓
Saudi Arabia	✓
Singapore	✓
South Africa	✓
South Korea	✓
Spain	✓
Sweden	✓
Switzerland (Virt-X, SWX)	✓
Taiwan	✓
Thailand	✓
Turkey	✓
U.K.	✓
U.S.	✓

Company

HSBC Bank plc

Department/Division

Customised Execution Services

Service or Product

Program Trading (PTA) / Algorithmic Trading (DSA) / Remote Trading (DMA) / Quantitative & Indexation Strategies

Launch Date

2007

Number of Clients

800

Website

www.hsbc.com

Claimed Feature(s)

- Total Anonymity. • Ongoing adaptation. • Globally Contingent.

Claimed Advantage(s)

- Able to combine all CES products (PTA / DMA / DSA) with local custody focused on Emerging Markets. • Seamless STP enabled wholesale solution for Buy & Sell Side. • Single anonymous CES relationship with a regional connection for global execution & settlement. • Cash &/ or SWAP basis across Program, DMA, DSA orders with HSBC providing either the Cash Custody or SWAP.

Special Facilities

- DMA for UK Small & MidCap stocks • Internal SOR • Program Algos

Asset Classes

- Equities

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Instinet

Instinet is a wholly owned subsidiary of Nomura and acts as an agency broker in markets globally. The company operates a number of front-end trading systems, crossing networks and maintains smart-routing technology and a suite of algorithms. Among its alternative trading system offerings are CBX in the US, JapanCrossing in Asia, and BlockMatch in Europe.

Instinet runs a suite of event-driven algorithmic trading models, branded the Execution Experts, that is divided into liquidity sourcing, benchmarking and participation strategies

Nighthawk, the firm's global dark liquidity aggregation algorithm, reaches nearly all dark pools globally that are open to reciprocal connectivity. Other popular

Description of Algorithms

Benchmark Strategies	The Instinet Execution Experts' benchmark-driven algorithms use sophisticated price and liquidity discovery techniques in a risk-controlled framework to achieve best execution. The benchmark strategies operate in a schedule-free environment, instead using a risk/return framework that enable them to behave more like human traders, constantly monitoring for attractive prices and liquidity. The benchmark strategies include VWAP, Participation, TWAP, IS and TargetClose.
Cobra	Cobra is a stealth, liquidity-seeking algorithm designed to minimize signalling and market impact while maximizing shares traded. Cobra opportunistically interacts with displayed volume, leveraging the Experts' high speed analytics platform to identify attractive times to demand liquidity. It will also make extensive use of passive hidden orders combined with proprietary pegging logic to minimize signalling risk, and purposely alters its trading tactics to avoid predictable patterns that other market participants could exploit. Cobra's Execution Style parameter (Passive, Normal, Aggressive and Super-Aggressive) allows users to control overall behaviour of the strategy, as it will adjust sizes and frequency of order submissions, and sensitivity to trading conditions.
Nighthawk	Leveraged by all algorithms within the Instinet Executions Experts suite, Nighthawk is an intelligent dark-liquidity aggregation strategy that incorporates sophisticated price-modelling and allocation logic. Nighthawk, which sweeps over 20 dark liquidity venues using a strategy that is optimized for each venue and that dynamically allocating shares to the most active destinations, uses an array of sophisticated techniques to reduce adverse selection, signalling and potential gaming. Nighthawk prices submissions at the mid-point or better, and monitors short-term volatility to minimise the risk of providing liquidity at unattractive price levels.
TEN	A multi-benchmark strategy, TEN allows users to balance tracking VWAP, Arrival and Departure price by assigning weights to each of the three benchmarks. TEN uses Dynamic Programming optimisation to integrate Instinet's price and volume prediction models into a robust benchmark strategy.

strategies include Cobra, which intelligently reduces market signalling and opportunistically accesses both light and dark liquidity, and TEN, a multi-benchmark strategy that allows users to balance tracking VWAP, Arrival and Departure price by assigning weights to each of

the three benchmarks. Access to the algorithms is via Instinet's EMS platforms, through third-party EMS providers or directly using a FIX interface.

Interfaces	
Advent	✓
Beauchamp	✓
Bloomberg	✓
Charles River	✓
ConvergEx	✓
Fidessa LatentZero	✓
FlexTrade	✓
Indata	✓
InfoReach	✓
ITG	✓
JPMorgan	✓
Linedata Longview	✓
Portware	✓
SunGard Global Trading	✓
Trading Screen	✓
Common Algorithms	
Custom	✓
Implementation Shortfall	✓
Pairs	✓
TWAP	✓
VWAP	✓

Markets	
Australia	✓
Austria	✓
Belgium	✓
Canada	✓
Czech Republic	✓
Denmark	✓
Finland	✓
France	✓
Germany	✓
Hong Kong	✓
Hungary	✓
India	✓
Italy	✓
Japan	✓
Mexico	✓
Netherlands	✓
Norway	✓
Poland	✓
Singapore	✓
South Africa	✓
South Korea	✓
Spain	✓
Sweden	✓
Switzerland	✓
Taiwan	✓
Thailand	✓
United Kingdom	✓
United States	✓

Company

Instinet

Department/Division

Instinet Execution Experts

Service or Product

Direct Execution Services

Launch Date

January 2008

Number of Clients

1,200

Website

www.instinet.com

Claimed Feature(s)

- Event-driven algorithmic trading environment.
- Unified risk/return framework.
- Sophisticated price and liquidity discovery.
- Modular architecture.
- Rapid customisation and innovation.

Claimed Advantage(s)

- While most firms offer one dark liquidity aggregation algorithm, all of Instinet's can intelligently access dark liquidity.
- One unified component-based framework allows Instinet to customize and develop algos sometimes in less than a day.
- All algos are event-driven, rather than schedule-driven.

Special Facilities

N/A

Asset Classes

• Equities • Options

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Investment Technology Group

Investment Technology Group Inc., is an independent agency broker and financial technology firm that partners with asset managers globally to improve performance throughout the investment process.

A leader in electronic trading since launching the POSIT crossing system in 1987, ITG takes a consultative approach in delivering the highest quality institutional liquidity, market-leading execution services, measurement tools, and proprietary data. Asset

managers rely on ITG's independence, experience, and intellectual capital to help mitigate risk, improve performance and navigate increasingly complex markets.

ITG is a leading innovator in algorithmic trading. As such, we offer some of the most sophisticated automated strategies available-all aimed at reducing market impact, maximizing execution quality, and improving trading performance. ITG Algorithms automate trade executions based on unique insights from pre- and

Description of Algorithms

Dark	Provides access to multiple venues seeking out hidden liquidity with minimal information leakage and signalling risk
Active	Actively works orders by looking at market conditions, targeting arrival price. Trades opportunistically minimising implementation shortfall will optimise execution
Active X	Aggressive version of Active, will be an active market participant until completion
Opportunistic	Utilises stealth trading style and pounce logic to minimise market impact
Float	Works passively to earn the spread
Volume Participate	Participate in exchange traded volume at specified rate
Close	Optimise executions into the close
Raider	Spread and liquidity sensitive algorithm. Never posts, opportunistically takes liquidity
Flexible Participation	Adapts participation rate according to the price of the stock
Dynamic Implementation Shortfall	List-based strategy to manage portfolio trades with complex objectives and constraints

post-trade analysis. We offer algorithms for single-stock and list-based trading to meet multiple objectives and trading styles.

Interfaces

Bloomberg	✓
Charles River	✓
ConvergEx	✓
Fidessa LatentZero	✓
Flextrade	✓
InfoReach	✓
Linedata Longview	✓
Portware	✓
ITG	✓
REDI	✓
Trading Screen	✓

Markets

Australia	✓	Malaysia	✓
Austria	✓	Mexico	✓
Belgium	✓	Netherlands	✓
Brazil	✓	Norway	✓
Canada	✓	Poland	✓
Denmark	✓	Portugal	✓
Finland	✓	Singapore	✓
France	✓	South Africa	✓
Germany	✓	South Korea	✓
Greece	✓	Spain	✓
Hong Kong	✓	Sweden	✓
Hungary	✓	Switzerland	✓
Ireland	✓	Taiwan	✓
Indonesia	✓	Turkey	✓
Israel	✓	U.K.	✓
Italy	✓	U.S.	✓
Japan	✓		

Company

Investment Technology Group (ITG)

Department/Division

Electronic Trading

Service or Product

ITG Algorithms

Launch Date

ITG in Europe was launched in 1998 and algorithms were introduced in 2004

Number of Clients

300+

Website

www.itg.com

Claimed Feature(s)

- Large choice of scheduled and participation-based algos. • Single stock and list options available. • Access to multiple liquidity destinations. • Unique access to POSIT - ITG's own dark pool.

Claimed Advantage(s)

- Agency status means all algos are developed to benefit clients. • Agency status also ensures information leakage is minimised. • High degree of customisation is available. • Anti-gaming logic is built-in to protect users. • Dedicated algo support team. • Transparency - a report detailing where/when trades were executed is provided.

Special Facilities

- Access to POSIT • Integration with pre- and post-trade analytical products • EMS/OMS integration • Smart Order Routing • DMA • Agency only desk • Suite of market-leading algorithms • Regional customisation to suit local marketplace

Asset Classes

- Equities

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Jefferies

Jefferies, a global securities and investment banking firm, has served companies and their investors for nearly 50 years. Headquartered in New York City, with offices in more than 25 cities around the world, Jefferies provides clients with capital markets and financial advisory services, institutional brokerage,

securities research and asset management. The firm provides investors with fundamental research and trade execution in equity, equity-linked, and fixed income securities, including corporate bonds, high yield bonds, US government and agency securities, repo finance, mortgage- and asset-backed securities, municipal bonds, whole

Description of Algorithms

Trader	Enables traders to interact dynamically with a working order. Trader allows pausing of strategies, checking and sweeping of dark pools and one click switching of strategies, and all of these can be done without the need to re-key the order.
MultiScale	Offers multiple trading strategies on a single working order. Different strategies will be activated when prescribed limits are hit, the limits can be price or relative value.
Pairs	Trades two stocks simultaneously without getting legged. Offers Ratio, Risk Arb, and Net Return modes.
Blitz	Gets the order done by aggressively executing in all displayed and non-displayed markets. Blitz has three modes: Price Improve – Will aggressively sweep at the bid/offer while intelligently posting liquidity at various price points. Additional sweeps are triggered once the orders POV drops below a certain rate. Good for large orders in illiquid names. Opportunistic – Will keep track of displayed quote sizes and will sweep when size conditions are favourable. Useful when a stock does not have deep display books. Get it Done – Will sweep till the order is complete.
Seek	Uncovers liquidity in both displayed and non displayed markets and has three modes: Passive, Active and Aggressive.
DarkSeek	Uncovers liquidity opportunities only in non-displayed markets and has three modes: Passive, Active and Aggressive.

loans and emerging markets debt, as well as commodities and derivatives. Jefferies offers companies capital markets, merger and acquisition, restructuring and other financial advisory services.

Jefferies Electronic Trading Services provides innovative algorithmic trading

strategies and solutions to clients. Jefferies' team of developers has designed a unique suite of algorithms and workflow solutions with today's complex and fragmented market structure in mind, allowing clients to have greater control of their orders and maximizing trading performance. Jefferies'

Concepts

Customisation

While Jefferies offers a core set of algorithmic trading tactics, we also understand that there is no one-size-fits-all solution to trading electronically. Traders often will have differing interpretations and expectations when it comes to algorithms and their behaviours. Our platform has a flexible architecture, allowing for modifications down to the lowest level of the algorithm. We also work with our clients from the ground up, building custom tactics virtually from scratch.

WoW

Jefferies' algorithms are Would or Work (WoW)-enabled, allowing a switch from one strategy to another when a particular price point or level are hit.

Common Algorithms

Finale (Market on Close)	✓
VolPart (Percentage of Volume)	✓
Strike (Implementation Shortfall)	✓
TWAP	✓
VWAP	✓

Company

Jefferies

Department/Division

Electronic Trading Services / Equity

Service or Product

DMA/Algo

Launch Date

2009

Website

www.jefferies.com

Claimed Feature(s)

- DMA and Algorithmic trading capabilities across Americas, Europe and Asia
- Robust FIX architecture designed for customisation.

Claimed Advantage(s)

- Designed by a team with over 30 years of experience building algorithms with fragmentation and anti-gaming logic at their heart.
- All algorithms can be fully customised down to the client/ trader/ algo/urgency level
- Total anonymity
- Customised performance monitoring.

Special Facilities

- DMA
- Customisations
- Broad OMS/EMS integration
- Smart order routing

Asset Classes

- Equities

Contact

Europe
ETS Desk, London
+44 20 7829 8400

North America
ETS Desk, New York
+1 212 325 7424

>>

Markets

Australia	✓
Austria	✓
Belgium	✓
Brazil	✓
Burgundy	✓
Canada	✓
Chi-X	✓
Denmark	✓
Finland	✓
France	✓
Germany	✓
Greece	✓
Hong Kong	✓
Hungary	✓
Ireland	✓
Israel	✓
Italy	✓
Japan	✓
Mexico	✓
Netherlands	✓
Norway	✓
Poland	✓
Portugal	✓
Singapore	✓
South Africa	✓
Spain	✓
Sweden	✓
Switzerland	✓
Thailand	✓
Turquoise	✓
United Kingdom	✓
United States	✓

products are supported by a dedicated team of professionals who work with clients navigating today's markets in search of liquidity. Jefferies is a global firm focused on providing best in class ideas, execution and service to our clients.

Interfaces

Bloomberg	✓
Charles River	✓
Eze Castle (ConvergEx)	✓
Fidessa	✓
Flextrade	✓
InfoReach	✓
Linedata Longview	✓
Macgregor (ITG)	✓
Mixit	✓
Moxy (Advent)	✓
Neovest (JP Morgan)	✓
Newport (Instinet)	✓
Portware	✓
RealTick (ConvergEx)	✓
Sungard Global Trading	✓
Thomson Reuters	✓
Trading Screen	✓
Triton (ITG)	✓

JP Morgan

JP Morgan's algorithmic trading products are part of the Electronic Client Solutions (ECS) Group offering, which provide end-to-end execution capabilities across global markets. From research and execution, to clearing through settlement, our solutions offer a reliable, advanced platform designed to simplify and enhance our clients' trading performance.

Bespoke technology, tailored to individual needs, enables clients to trade across different markets and a wide range of asset classes including Equities, Futures & Options, Fixed Income and FX. JP Morgan also provides access to liquidity on both single and multi-dealer platforms including the Neovest broker-neutral EMS platform, which integrates

Description of Algorithms

Aqua	Aqua is a rapid execution algorithm for liquid securities. It aims to help seek and extract liquidity when there is a need to execute quickly and decisively based upon a strong view. Utilises all available sources of 'Dark Liquidity' both internally and externally where appropriate
Arid	Arid is an implementation-shortfall algorithm designed specifically for less liquid securities. It will post liquidity discretely, take liquidity of advantageous size or price and try to effect trades within the spread without moving the market. The behaviour of the algorithm is modified according to the characteristics of the security being traded and the urgency level set by the trader. Arid automatically participates in Dark liquidity venues.
Close	Aims to achieve the closing price for the current day. If expected liquidity is sufficient, your entire order will be placed into the closing auction. If not, the algorithm will work the order into the close starting as late as it can to complete the order with minimum impact.
Iceberg	Iceberg will display an appropriate amount of your order to the exchange at your chosen limit price. Either specify your own display size or let the strategy choose.
Implementation Shortfall	IS helps you to target your chosen price benchmark (arrival, open or previous close). Will dynamically adjust the rate of execution of your order based upon size, your own view of the market and where the market is relative to your benchmark. IS automatically participates in Dark liquidity venues.
Peg	Peg is a passive algorithm which will allow you to join and track the best bid or offer automatically. PEG will place passive orders of discrete size, replenishing when filled, until your order is complete.

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Interfaces

Advent	✓
Bloomberg	✓
Charles River	✓
ConvergEx	✓
Fidessa LatentZero	✓
FlexTrade	✓
ITG	✓
JPMorgan	✓
Linedata Longview	✓
Portware	✓
REDI	✓
Reuters	✓
SunGard Global Trading	✓
TraderForce	✓

direct market access (DMA) and algorithmic management in a user-friendly, highly customisable application. Neovest was acquired, and became a wholly owned subsidiary of JP Morgan in 2005. Access to all major publicly available liquidity venues is offered via the ECS platform of execution algorithmic strategies, including JP Morgan Lighthouse-X, its in-house crossing facility.

Their offerings are not only bolstered by a robust infrastructure but also by our dedicated and experienced teams, providing access to JP Morgan's truly global resources. ECS has specialist teams situated in New York, London, Hong Kong, Tokyo and Sydney, thereby offering

a 'round the clock' electronic execution service necessary in today's challenging market environment. We believe that technology and knowledge are the foundation for a successful partnership, and that is how the ECS group aims to deliver solutions to meet client's execution requirements.

Incorporated within the product suit are the two leading algorithmic strategies Aqua and Arid, each offering a comprehensive approach to sourcing liquidity and delivering superior execution performance. Aqua is a rapid execution strategy for liquid securities, opportunistically seeking liquidity and executing decisively upon a strong view. This is Important when

Common Algorithms

Close	✓
Iceberg	✓
Implementation Shortfall	✓
Peg	✓
Percent of Volume	✓
TWAP	✓
VWAP	✓

targeting excess alpha in the investment decision. Arid is an implementation-shortfall based strategy for less liquid stocks that executes discreetly and intelligently when it is especially important to avoid signalling in the market. The powerful combination of solid, intuitive execution

strategies allied with proactive and responsive trade consultation from the service desks makes for an altogether bespoke trading experience.

Markets

Argentina	✓	Malaysia	✓
Australia	✓	Mexico	✓
Austria	✓	Netherlands	✓
Belgium	✓	New Zealand	✓
Brazil	✓	Norway	✓
Canada	✓	Pakistan	✓
Chile	✓	Peru	✓
China	✓	Poland	✓
Czech Republic	✓	Portugal	✓
Denmark	✓	Russia	✓
Finland	✓	Singapore	✓
France	✓	South Africa	✓
Germany	✓	Spain	✓
Hong Kong	✓	Sri Lanka	✓
Hungary	✓	Sweden	✓
India	✓	Switzerland	✓
Indonesia	✓	Taiwan	✓
Ireland	✓	Thailand	✓
Israel	✓	Turkey	✓
Italy	✓	United Kingdom	✓
Japan	✓	United States	✓
Luxembourg	✓	Venezuela	✓

Company

JP Morgan

Department/Division

Investment Banking

Service or Product

Electronic Client Solutions

Website

www.jpmorgan.com/ecs

Claimed Feature(s)

- Robust architecture.
- Highly customisable connectivity solutions.
- Global multi-asset class electronic trading platform.
- Bespoke algorithmic strategy customisations.

Claimed Advantage(s)

- Industry-recognised client service model.
- Dedicated specialist electronic sales trading team.

Special Facilities

- JPMX • Smart Order Routing
- Dark Pool Access • Industry leading pre- and post-trade analytics

Asset Classes

- Global Equities • Global Futures & Options • Global FX • Global Credit

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Knight

Knight's EdgeTrade Algorithmic Trading Strategies offers a comprehensive suite of algorithms that help buy- and sell-side clients to source liquidity while seeking best execution in a fragmented marketplace.

Price, Smart Vtrack) – was developed using the collective experience of its quantitative professionals, in-depth feedback from clients, and Knight's liquidity. All algorithms are geared towards helping clients achieve their specific trading objectives.

Common Algorithms

Arrival Price	✓
Custom	✓
TWAP	✓
VWAP	✓

The firm's suite of algorithmic trading strategies – which include smart order execution (FAN, Covert, Sumo, Oasis and Pairs), and benchmark and participation algorithms (VWAP, TWAP, Arrival

Knight has successfully completed expanding its electronic and algorithmic offering in Europe and is building in Asia as fragmentation continues to go

Description of Algorithms

Oasis	Unique and focused smart order execution algorithm that is tailored specifically to source small- and mid-cap liquidity. Powered by FAN technology.
Covert	Sweeps and probes ATSs. Rest (post) intelligently in dark-pools. Ability to IOC.
FAN	Sweep and probe dark pools and public markets for liquidity. Simultaneously rest and intelligently circulate shares throughout dark pools (and back to ATSs and public markets). Ability to IOC.
Smart VTrack	Aggressive volume tracking algorithm driven by FAN. When in-line with participation parameters, strategy intelligently seeks to match public market volume by participating in displayed and non-displayed markets. Powered by FAN technology.
Sumo	Time urgent. Uses real-time and historical liquidity measures to determine speed in completing an order. Powered by FAN technology.
Pairs Trading	Knight Direct - These new capabilities allows client to monitor spread market conditions as well as execute and interact with Pairs strategies powered by FAN.
10b-18	Monitors trade quotes in real-time to ensure compliance with time and price conditions for issuer stock repurchases with the use of algorithms (VWAP, TWAP, Arrival Price, and Smart VTrack)
Target Close	Algorithmically target closing price using historical and real time execution data. Powered by FAN.

global. With the emergence of numerous MTFs, tools that source liquidity in an increasingly fragmented market have become an essential technology for the trader. Based on the success of FAN in the U.S., EdgeTrade has reengineered and customized its smart order execution technology for the European and Asian microstructure landscape.

FAN is the algorithmic solution that accesses actionable liquidity in an adaptive and efficient way. It provides a range of features parameterized by price,

urgency and anonymity, allowing the trader to have control over the order as it executes. Using this smart order execution technology can also result in significant price improvement. With numerous market destinations, it is imperative that buy- and sell-side traders have liquidity-sourcing technology that adapts dynamically to executions wherever they are occurring in real time, providing efficient and cost-effective trade execution while maintaining market anonymity.

Interfaces	
Advent	✓
Aegis Athena	✓
Bloomberg	✓
Charles River	✓
ConvergEx	✓
ESP	✓
Fidessa LatentZero	✓
Flextrade	✓
InfoReach	✓
ITG	✓
JP Morgan	✓
MFN	✓
Mixit	✓
NYSE Technologies	✓
SunGard Global Trading	✓

Markets	
Austria	✓
Belgium	✓
Canada	✓
Denmark	✓
Finland	✓
France	✓
Germany	✓
Iceland	✓
Ireland	✓
Italy	✓
Netherlands	✓
Norway	✓
Portugal	✓
Sweden	✓
Switzerland	✓
U.K.	✓
U.S.	✓

Company Knight
Department/Division Knight Direct LLC
Service or Product EdgeTrade Algorithmic Suite
Launch Date 2004 (common benchmarks), 2005 (smart order execution)
Number of Clients 2600+
Website www.knight.com
Claimed Feature(s) • Agency-Only. • Adaptive Algorithms. • Anonymous. • Customizable. • Access to Knight's Unique Liquidity.
Claimed Advantage(s) • Sourcing and aggregation of disparate liquidity (dark/displayed, active/passive). • Reduce information leakage. • Reduce transaction costs. • Adapts to real-time trading to efficiently seek out liquidity.
Special Facilities • Knight Direct EMS • FIX 4.0-4.2 • Agency-Only Desk • Broad OMS integration
Asset Classes • Equities
Contact Europe Bradley Duke +44 (0)20 7997 2200 bduke@knight.com U.S. Joe Wald (+1) 212.479.2335 jwald@knight.com support@edgetrade.com

Macquarie Group

Macquarie Group is a global provider of banking, financial, advisory, investment and funds management services. Founded in 1969, Macquarie now employs more than 15,500 people in over 70 office locations in 28

Description of Algorithms

Gradient	Trades in-line with volume, the participation rate is determined by the movement of the stock price relative to a dynamic reference price. This strategy is useful for stocks which exhibit mean reversion – trading more aggressively when the market moves towards you and less aggressive as the market moves away. The participation rate moves linearly between the min%vol and max%vol for a range of price ticks around the reference price. The dynamic reference price can be of a wide range of benchmarks (VSOT, VWAP, AVG, IndexRelative, etc). The participation rates can be flipped (for trending stocks). The strategy uses an optimal trading model from an analytics engine if no min%vol or max%vol are provided.
Step	Trades in-line with volume, the participation rate is stepped up/down as the stock price moves in favour/against a reference price. The client can define any number of participation levels in relation to reference price.
Dynamic	Trades in-line with volume, the participation rate is stepped up/down between two values as the stock price moves in favour/against a benchmark price. Dynamic is very similar to Gradient except the strategy counts volume in two distinct price bands. The reference price can be a benchmark or static.
Stealth	Aims to complete an order as quickly and quietly as possible, it offers a small amount volume on the near touch (at multiple price levels) while taking volume within limit price on the far touch. The Strategy always maximises queue priority by working worst places order first. It can work the residual in a dark venue.
Peg	Dynamically pegs a slice to a market price, while keeping the full size hidden. The size of the slice depends on the average order book size. By default, PEG will send a single slice to follow volume in the market. To get better queue priority, it can also send slices to multiple price levels (every tick, alternate ticks or price levels with existing volume). The strategy always works the worst place order first. Anti-gaming features can pause for a random delay before sending volume at a certain prices. The strategy will not follow very small size in the order book. The strategy can also send the hidden volume to a dark venue.
Sniper	Hides the order from market. Sends slices as soon as volume appears within limit price at/or bigger than the minimum trade size. The size of each slice is calculated to leave residual volume in the market as determined by Style. The remainder of the parent order always remains hidden. If an exchange does not support IOC type, algo will simulate this function by sending a cancel request if the slice misses volume.
Dark	Slices to dark crossing venues, internal or external, at various price points.

countries. As of September 30, 2010, Macquarie had assets under management of US\$307 billion. Macquarie's main business focus is making returns by providing a diversified range of services to clients.

Macquarie acts on behalf of institutional, corporate and retail clients and counterparties around the world. As a specialist in Asia/Pacific electronic trading, Macquarie's algorithms were built in Asia, for Asia, and they are used in all the markets where electronic trading is enabled through Macquarie's own seats. As Macquarie is not encumbered by legacy technology solutions, its algo technology is best of breed. The platform

is designed to allow very quick customisation of strategies down to the trader level, including some recent enhancements such as dynamic limits, 'Halo' and dark strategies. In the 2011 Bloomberg World's Best Broker rankings (for execution quality) Macquarie was ranked #1 in Asia and #3 globally.

Macquarie's electronic execution platform utilises advanced trading technology and infrastructure to provide a complete collection of tailored electronic trading tools. Developed and designed specifically for individual Pan Asian markets, our algorithmic strategies allow traders to achieve desired benchmark and trading objectives with

Common Algorithms

Open	✓
Close	✓
Implementation Shortfall	✓
In Line with volume	✓
VWAP	✓
TWAP	✓
PWP	✓

Company

Macquarie

Department/Division

Electronic Execution

Service or Product

Algorithmic Trading

Launch Date

2006

Number of Clients

1700

Website

www.macquarie.com/mgl/com

Claimed Feature(s)

- Strategies highly configurable down to the trader level.
- Full range of execution strategies.
- Bloomberg ranked Macquarie number 1 in Asia for Execution this year (2010).
- Liquidity seeking in internal / external dark pools (not all markets).

Claimed Advantage(s)

- Dynamic pricing (HALO) is a major competitive advantage. They can be applied to all our core strategies. It allows limit prices and 'get me done' prices to be defined in relation to benchmarks (AvgPrice, Close, Open, VSOT, VWAP, Arrival, DayHigh, DayLow, Index, Sector...). These features enable you to be aggressive when opportunities arise, more passive during adverse price moves and provides index relative trading.
- We have individual curves for each stock and use special trading curves for options expiry and SQ days.
- The development team is located in HK, Japan and Australia. It specialises in Asia trading.
- Coverage through our own seat in all the markets in Asia, except Philippines.

Special Facilities

- DMA
- Customizable Algorithms
- Internal Crossing

Asset Classes

- Equities



Contact

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complete control.

Macquarie’s Direct Market Access (DMA) offers high speed, low latency access to all major Asian markets, complete with Smart Order Routing (SOR) capability and intelligent synthetic DMA features. Using three service and development hubs in Hong Kong, Tokyo and Sydney, Macquarie offers a highly customisable and personalized best in class product. With full execution consultancy services available, clients can tap into Macquarie’s knowledge base and skill set to enhance performance, utilising complete algo development/ design, customisation, trade analytics and technology.

Markets

Australia	✓
Austria	✓
Canada	✓
France	✓
Germany	✓
Hong Kong	✓
India	✓
Indonesia	✓
Ireland	✓
Japan	✓
Korea	✓
Malaysia	✓
Netherlands	✓
Singapore	✓
South Africa	✓
Sweden	✓
Switzerland	✓
Taiwan	✓
Thailand	✓
United Arab Emirates	✓
U.K.	✓
U.S.	✓

Interfaces

Bloomberg	✓
Charles River	✓
ConvergEx	✓
Fidessa LatentZero	✓
Instinet	✓
ITG	✓
Linedata Longview	✓
Metabit	✓
Portware	✓
Trading Screen	✓
Tora	✓

Morgan Stanley Electronic Trading (MSET) provides the complete spectrum of services from pre-trade analytics and execution, to post-trade execution performance analysis and commission management. They offer a comprehensive algorithmic trading suite and various direct market access (DMA) strategies, including smart order routing technology and a dark liquidity pool

aggregator.

Clients can connect either via FIX, using a proprietary front-end or a third-party vendor, or via Morgan Stanley's Passport execution management system. Their global product offering provides access to trade portfolios, single stocks, ETFs, options, futures, swaps, and foreign exchange.

Common Algorithms

Close	✓
Price React	✓
Target Percent of Volume	✓
TWAP	✓
Volume Dispense	✓
VWAP	✓

Description of Algorithms

NightOwl	Maximises liquidity access across dark pools, ECN/MTF non-displayed limit order books and displayed markets simultaneously.
Pairs Trader	Gives traders the ability to trade two stocks quickly and effortlessly based on a function of the spread.
Arrival Price - mid point	Benchmarks an order against the mid-point price when it enters the market, balancing the trade-off between market impact and execution risk.
MS Port	A portfolio level, implementation shortfall algorithm with optional basket trading features like cash balance. MS Port optimises overall execution and risk management for baskets versus single-stock algorithms.



Company Morgan Stanley
Department/Division Electronic Trading
Service or Product Morgan Stanley Electronic Trading (MSET)
Launch Date 1999
Number of Clients 2500+
Website www.morganstanley.com
Claimed Feature(s) <ul style="list-style-type: none">• Manage performance against benchmark targets• Adjust automatically for seasonal volume differences (e.g., expiration days, quarter end).• Respond in real time to changes in volumes, bid-ask spreads, volatility and a variety of other market factors.• Benefit from enhanced crossing opportunities in MS Pool.• Access all available exchanges, ECNs and MTFs simultaneously through Morgan Stanley's Smart Order Routing Technology.• Benefit from dedicated account coverage with first-class support and service.• Maintain full control of the execution process with the ability to monitor performance and impose volume and price constraints.• Receive real-time execution reports into your OMS or Passport.
Claimed Advantage(s) <ul style="list-style-type: none">• Transparency - We provide full clarity on how your order was routed and where it was traded.• Anonymity - We do not leak information about your order in our routing infrastructure or in our dark liquidity pools.• Standards - We work with regulators and industry leaders to create standards for tabulating and advertising traded volumes.• Trading Consultancy - Our execution consultants are dedicated to guiding you through the entire life of your trade.• Trust – It's your order. It's your information. Your trade is none of our business.

MSET algorithms measure execution performance versus their selected benchmark and provide quality financial engineering reflecting an in-depth understanding of market structure. The algorithms have been designed to offer controls and options that will assist in the execution of several industry standard order

objectives.

Although the underlying mathematics and numerical techniques of the algorithms are complex and subtle, the goal of each algorithm is to provide tools that offer intuitive control and visibility. Focusing on more innovative strategies demanded by their clients

Markets			
Australia	✓	Japan	✓
Austria	✓	Mexico	✓
Belgium	✓	Netherlands	✓
Brazil	✓	Norway	✓
Canada	✓	Portugal	✓
Denmark	✓	Singapore	✓
Finland	✓	South Africa	✓
France	✓	South Korea	✓
Germany	✓	Spain	✓
Greece	✓	Sweden	✓
Hong Kong	✓	Switzerland	✓
India	✓	U.K.	✓
Ireland	✓	U.S.	✓
Italy	✓		
Concepts			
Customized Solutions	Beyond traditional strategies, we provide customized solutions to the trader. Our execution consultants work with traders to develop, implement and analyze the customized solutions.		

(e.g. NightOwl) has helped accelerate the growth in algorithm usage. This volume interacts with Morgan Stanley's liquidity pools, allowing improved order matching with minimal market impact.

Interfaces

Advent	✓
Bloomberg	✓
Brass	✓
Charles River	✓
ConvergEx	✓
Fidessa LatentZero	✓
Flextrade	✓
Inforeach	✓
Instinet	✓
ITG	✓
JP Morgan	✓
Linedata Longview	✓
Neonet	✓
Paladyne	✓
Portware	✓
Proprietary	✓
Reuters	✓
SunGard Global Trading	✓
Tethys	✓
Tora	✓
Trading Screen	✓

Special Facilities

• MS Analytics • Smart Order Routing • Internal Dark Pool • EMS

Asset Classes

• Equities • Futures • Options • Swaps • FX • ETF's

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Nomura

Nomura's electronic trading suite, ModelEx, provides a full complement of services for institutional, hedge fund and broker-dealer clients across Equities and Futures.

ModelEx represents a stable and dynamic way of implementing trading strategies whilst

minimising market impact through either intelligent algorithms or direct market access which are both supported by industry leading technology.

ModelEx has been designed on robust and scalable infrastructure which is fully customisable. The strategies

Description of Algorithms

Portfolio Strike

A custom implementation shortfall strategy specifically for portfolios where the user specifies the trading urgency, the target delta neutrality, price and/or volume constraints of the overall portfolio and its constituent stocks. Trading this strategy provides access to Nomura's proprietary statistical models and ensures portfolios are traded dynamically and re-adjusted to take into account real-time market conditions.

Active IS

An aggressive participation strategy that aims to trade volume at arrival price, whilst also opportunistically taking advantage of any price improvements (compared to this arrival price) by sweeping the order book at specific quote thresholds, where possible. This trading style can be accompanied with a passive trading phase determined by user-specified settings.

Ratio Pairs

Works a basket of pairs of stocks (or futures) based on price targets. Trades the basket using Nomura's proprietary signals to capture the positions with minimal market impact but with adapting urgency to achieve the inventory at an optimal ratio.

Risk Arb Pairs

Looks to work a pair focusing on achieving or bettering the target ratio as quickly as possible. Scans market data to complete an order as quickly as possible within the ratio specified. A highly customisable strategy that is suitable for Relative Value and Merger / Acquisition deals.

Guaranteed Strike

Represents an electronic guaranteed capital provision from Nomura. Trades are executed immediately against the strike benchmark, for a universe in excess of 1,000 stocks and select ETFs. GStrike is designed to immediately execute a trade at the touch/mid price. This service allows a client to trade at 'touch' for given quantities; however, greater sizes are offered at a price outside touch.

Smart Dark (Dark Only Algorithm)

The Smart Dark algorithm which is designed to execute within Nomura's dark pool (NX) and other dark-only venues by floating either the whole order quantity immediately or via gradual amounts over a user-specified trade time horizon.

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which we make available to clients have a track record of competitive execution performance and are equally used by Nomura's own in-house traders. Anti-gaming, crossing, rapid access to alternate liquidity and best execution continue to be integral pillars of the platform; and when coupled with TradeSpex, Nomura's dedicated analytics portal, provides clients with an

optimal trading experience.

ModelEx adopts the use of dynamic volume and volatility profiling, proprietary alpha signals in the child order placement engine and smart order routing logic to ensure trading is executed in a manner that minimises market impact. Through a number of proprietary systems and dedicated service teams in each

Markets

Arca MTF	✓	NASDAQ OMX	✓
Australia	✓	Netherlands	✓
Austria	✓	Norway	✓
BATS Europe	✓	Poland	✓
Belgium	✓	Portugal	✓
Chi X	✓	Singapore	✓
Czech Republic	✓	Smartpool	✓
Denmark	✓	South Africa	✓
Finland	✓	Spain	✓
France	✓	Sweden	✓
Germany	✓	Switzerland (SIX, SWX)	✓
Greece	✓	SWX Swiss Block	✓
Hong Kong	✓	Taiwan	✓
Hungary	✓	Turquoise	✓
India	✓	U.K.	✓
Italy	✓	U.S.	✓
Japan	✓		

Company

Nomura

Department/Division

Electronic Trading Services

Service or Product

ModelEx

Launch Date

2009

Website

www.nomuranow.com

Claimed Feature(s)

- Nomura's ModelEx algorithmic suite has a strong performance track record.
- Global reach with market access to nearly 40 trading venues in 25 countries.
- Connectivity to over 30 vendors and the capacity to support in-house client solutions.
- All ModelEx strategies utilise Nomura's advanced smart order routing engine to efficiently capture lit and dark liquidity.
- Robust, scalable, low-latency infrastructure.
- 15% of client base use customised algo trading solutions developed by Nomura.

Claimed Advantage(s)

- SOR engine with dynamic posting logic which considers short term alpha indicators in the decision making process.
- Frequent recalibration and research of model indicators coupled with an intraday volume prediction model enhances performance.
- First Investment Bank to register dark pool as MTF.
- NX dark pool built with well formed price discovery checks and robust anti-gaming logic.

Special Facilities

- NX (Registered MTF)
- Smart Order Routing

Asset Classes

- Equities
- Futures
- Options
- ETFs

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region, Nomura is able to monitor and support client orders from order entry, through execution to order completion and transaction settlement.

In the current market

place, Nomura believes access to liquidity in both dark and lit venues continues to be paramount on the agenda of their clients. Thus Nomura's advanced and dynamic approach to seeking out

Description of Algorithms (cont.)

ETF Trading	Nomura can facilitate the trading of ETFs on either an agency or risk basis. Our ModelEx TWAP algorithm allows for agency execution of ETFs whilst trading the underlying, giving clients full control and transparency during execution. Risk capital can also be provided in a direct and automated manner via our ModelEx GStrike product. Both offerings are unique in the market and underscore Nomura's position as a leading ETF trading house.
Reload	Aims to grab liquidity available at a given price placing quotes on the order book if the price is not in limit. Places orders onto the order book at the given price and size. If they hit another quote and fill completely, sends a new order, otherwise waits for other participants to fill order before sending next one.
Float	Places orders on the passive side of the order book, reloading each time the order completely fills. The strategy moves with the quote to stay at the most competitive order book level.
Float and Pounce	Looks to trade passively unless well priced liquidity appears, when the strategy will grab as much as possible. Places orders passively at an appropriate size, then sweeps the book if the specified size is available at limit price or better.
Hide and Pounce	Aims to capture all the liquidity at a given price or better. It waits until the order book shows a given amount of shares at a specified price or better and then takes all the shares at that price or better.
Step	Looks to work the order, adjusting aggressiveness dynamically based on price. Targets a certain percentage of overall market volume. Adjusts the participation rate based on a user specified trigger price or price relative to an index, future or other stock.
Custom	Nomura constructs custom execution strategies for its clients. Clients can adapt available ModelEx strategies to suit their needs or request a hybrid of several strategies. All custom strategies are flexible and proprietary giving the client complete control over the execution process. With 15% of our client base using custom trading solutions Nomura excels in this respect.
Futures	ModelEx allows users to trade in Futures using Core strategies such as VWAP, TWAP and With Volume.

liquidity underpins all aspects of its ModelEx product suite.

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Common Algorithms

Implementation Shortfall	✓
Target Close	✓
Target Open	✓
TWAP	✓
VWAP	✓
With Volume	✓

Interfaces

Autex	✓	NRI IStar	✓
Bloomberg	✓	NYSE Technologies	✓
BT Radianz	✓	Options IT	✓
Charles River	✓	Peresys	✓
Citadel Technologies	✓	Portware	✓
ConvergEx	✓	Quicktrader	✓
Fidessa LatentZero	✓	Reuters	✓
Flextrade	✓	Simcorp	✓
Inforeach	✓	SunGard Global Trading	✓
Instinet	✓	Thinkfolio	✓
ITG	✓	Tora	✓
JP Morgan	✓	Townsend Analytics	✓
Linedata Longview	✓	Trading Screen	✓
Metabit	✓	Ullink	✓

**Numis
Securities**

Numis Securities is an independent investment banking and broking group focusing on high-quality London-quoted mid- and small-cap companies. With widely rated research and execution services, Numis Securities has been rated in the top two in the Extel survey for small capitalisation U.K. stocks in the last three years. Actively trading in nearly 400 stocks with expanding coverage into new sectors, Numis operates a research department that covers a wide variety of different industries.

Numis’s Alternative Execution Desk offers algorithmic, DMA and portfolio trading services,

dynamic algorithmic and SOR technology, and in-house quantitative based pre-/intra-/post-trade support tools. The firm cites last-mover advantage in its development of algorithms that trade off stock specific curves, leveraging Smart Order Routing and DMA technology to deliver clients highly customisable adaptive strategies. The Sherpa SOR aims to deliver intelligent routing to locate the best price and optimum liquidity. Numis AED aims to minimise execution shortfall and maximise liquidity aggregation.

Numis Securities offers a full front-to-back algorithmic and portfolio

Concepts

Opportunistic liquidity seeking

Diverse Volatility and Volume factors real-time inclusion

Description of Algorithms

Sherpa Dark

Numis dark aggregator is the trader essential tool to trade mid and small cap names in Europe. Strategically accessing most of the institutional and retail liquidity, it is suited for large trades seeking low market footprint and effective presence across all active crossing networks.

trading service. With access to multiple liquidity sources, and mid-cap trading expertise Numis Securities aims to provide a top tier execution service, and offers a proprietary impact cost model to allow its algorithms to re-optimize on a real-time basis. Additionally, the company operates a web-based pre-, intra- and post-trade analytics offering

Common Algorithms

Manage the Close	✓
Pairs Trader	✓
Implementation Shortfall	✓
Percent of Volume	✓
TWAP	✓
VWAP	✓

Interfaces

AutEX	✓	NYSE Technologies	✓
Bloomberg	✓	Portware	✓
BT Radianz	✓	Reuters	✓
Charles River	✓	SunGard Global Trading	✓
ConvergEx	✓	SWIFT	✓
Fidessa LatentZero	✓	TNS	✓
Flextrade	✓	TradeWare	✓
InfoReach	✓	Trading Screen	✓
ITG	✓		

with fully interactive advice available from the designated trading desk.

Markets

Austria	✓
Belgium	✓
Canada	✓
Denmark	✓
Finland	✓
France	✓
Germany	✓
Ireland	✓
Italy	✓
Netherlands	✓
Norway	✓
Portugal	✓
South Africa	✓
Spain	✓
Sweden	✓
Switzerland	✓
U.S.	✓
U.K.	✓

Company

Numis Securities

Department/Division

Equities Trading

Service or Product

Alternative Execution

Launch Date

September 2008

Number of Clients

50

Website

www.numiscorp.com

Claimed Feature(s)

- Solid performance across the liquidity spectrum.
- Direct access to most brokers internal dark pools.
- Privileged access to block crossing networks.
- Experienced traders to advise our clients.

Claimed Advantage(s)

- Our algos are highly stable and optimised to trade on illiquid names.
- We are a market leader in the FTSE 250 and we are constantly upgrading our execution suite.

Special Facilities

- DMA
- Smart Order Routing
- DSA
- STP

Asset Classes

- Equities

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Piper Jaffray

Piper Jaffray has an experienced and knowledge driven sales and trading team, offering a full suite of products in both equity and fixed income. We also support our clients’ goals through both traditional and electronic trading capabilities.

At Piper Jaffray, we are working to be your partners in the electronic trading space. We offer a broad spectrum of integrated client solutions—including seamless and timely

commission management services and soft dollar execution. Our superior service is led by a dedicated team of electronic trading professionals averaging 16 years of experience on the desk. We have experience in all standard electronic trading platforms, including algorithmic trading. More recently we’ve also launched a program trading desk to better serve our clients. Our full suite of electronic products includes:

Description of Algorithms

Hornet	Hornet represents our most aggressive trade strategy. It's designed to capture as much volume as possible up to a limit, while never posting. Hornet is ideal if you strive to secure stock as quickly as possible to capture alpha. Upon receipt of the order, Hornet takes all liquidity at the inside market and then uses hidden/discretionary orders to capture reposts at the previous inside market or better. At each price level, Hornet attempts to fill the order and, before moving to the next price level, it continuously pings for hidden liquidity between the spread. The degree of aggressiveness can be specified to control how quickly the model trades at new price levels up to the limit. When the limit is reached, Hornet waits for posted or hidden liquidity to be found at or better than the limit.
Fusion	To address the growing problem of fragmented liquidity and smaller execution sizes, Piper Jaffray developed Fusion, which allows customers to search for block liquidity anonymously in dark liquidity pools and crossing networks. Fusion can be accessed as either an order type or an order qualifier where it would allow a user to simultaneously execute an order using a Piper Jaffray algorithm while seeking dark liquidity crosses on the balance of the order.
InLine	InLine is appropriate for trade strategies focused on implementation shortfall/arrival price, and for stocks & baskets with high alpha decay. By default, orders are typically executed "in line" with 15%-20% of volume. In addition, our clients have the flexibility to specify target participation levels and to assign a price limit on their orders.

Our portfolio trading service partners our team with you to determine the risk profile and complexity of your portfolio, develop a cost estimate plan, execute based off the plan and analyse the results. We combine and leverage multiple liquidity sources, using our state-of-the-art order-placement strategies to deliver enhanced, value-added execution services. Our offering includes multifactor pre-trade analysis, customised trading strategies, intra-trade performance monitoring and detailed post-trade reporting. Piper Jaffray also offers a state-of-the-art platform for those clients who use third-party services paid for with 28(e) eligible commissions. Commissions are accrued daily, viewable online and exportable to Microsoft Excel. Commissions can be generated on any of the Piper Jaffray equity trading desks including cash, algorithmic, program trading and DMA.

Common Algorithms

10b-18	✓
Volume Tracker	✓
TWAP	✓
VWAP	✓

Markets

Australia	✓
Canada	✓
Finland	✓
France	✓
Germany	✓
Hong Kong	✓
Italy	✓
Japan	✓
Sweden	✓
Switzerland	✓
The Netherlands	✓
U.K.	✓
U.S.	✓

Interfaces

Advent	✓
Bloomberg	✓
CRD	✓
ConvergEx	✓
Flextrade	✓
Linedata Longview	✓
ITG	✓
Portware	✓
Reuters	✓

Company

Piper Jaffray & Co

Department/Division

Institutional Equities

Service or Product

Electronic Trading – Algorithms, DMA & Commission Management

Launch Date

2004

Number of Clients

100+

Website

www.piperjaffray.com

Claimed Feature(s)

- Expertise in the U.S. and international equity markets.
- Highly credible and timely research.
- Coverage of more than 350 companies with \$2 billion or less in market capitalisation.
- Creative ideas and thorough service
- Full Portfolio Trading and Commission Management Services.

Claimed Advantage(s)

N/A

Special Facilities

- Client Customised algorithms
- TCA

Asset Classes

- Equities

Contact

U.S. Headquarters

Piper Jaffray Electronic Trading Group
(877) 462-7649

**Pragma
Trading/
Weeden &
Co.**

Weeden & Co. is a full-service institutional equity and fixed-income broker with global trading capabilities. As a top-ranking institutional broker known for its independence, trading expertise and commitment to its clients, Weeden's integrated execution platform, sophisticated electronic trading group and value-added research products serve a customer base of over 1,000 institutions worldwide.

In a partnership with Weeden & Co., Pragma Trading's full suite of algorithms is offered as an electronic brokerage service. Founded in 2003, Pragma is a New York-based financial services firm and a leading independent provider of innovative trading solutions. As an established provider of top quality execution, proven technology, and unparalleled support and service, Pragma's suite of products includes OnePipe,

Description of Algorithms	
Capture	Capture is an aggressive, liquidity-sourcing algorithm that accesses hidden and displayed liquidity across dozens of venues. It exploits trading opportunities through a variety of tactics and proprietary liquidity signals, while keeping an eye on market impact to provide clients with an intelligent, aggressive solution for urgent orders. Capture has three primary components that work together simultaneously to ensure participation while waiting for liquidity opportunities:
Bullseye	Bullseye is our new aggressive DMA alternative. It provides an intelligent solution when immediate access to liquidity at specific price points is required. Bullseye can source a significant portion of all the available liquidity in the market (hidden and displayed) very quickly.
OnePipe 3.0 Algorithm	As a midpoint or better dark pool aggregation algorithm, OnePipe 3.0 unites over 40 dark pools, crossing networks, streaming liquidity venues and open market destinations into a single, integrated source. OnePipe is a customisable liquidity solution that will interact with different destinations based on the urgency of your order. Depending upon the chosen level, OnePipe will access dark or displayed liquidity, while using LifeGuard to help protect your order from gaming and information leakage.
Adaptive Overlays	Adaptive overlays allow advanced, dynamic customisation and comprehensive liquidity access. Pragma's innovative suite provides a heightened level of flexibility and control over how your algorithm reacts to various market conditions. Overlays are optional, can be mixed and matched, and collectively provide a level of control that until now has required either custom development or frequent manual intervention by traders.

LifeGuard's advanced anti-gaming logic, and sophisticated single stock and portfolio execution strategies.

Pragma's US equity algorithms address the full spectrum of traders' needs. Single-stock algorithms, from aggressive liquidity sourcing to opportunistic price-sensitive single-stock strategies effectively address both tactical and strategic single-stock trading objectives. Pragma's basket algorithms provide intelligent scheduling and flexible constraints for efficient systematic trading. All of Pragma's algorithms make use of Pragma OnePipe's extensive network of dark pool connections, Lifeguard

order protection logic and destination quality monitoring program, and use Pragma's advanced, high-performance microtrading components.

Pragma's superior execution tools encompass a full suite of sophisticated single stock and portfolio execution strategies. Pragma also provides algorithmic customisation services, offering rapid development and deployment of trading algorithms customised to achieve your specific trading objectives, and analytical support in tracking algorithmic performance.

Markets

Australia	✓
Brazil	✓
Canada	✓
Hong Kong	✓
Japan	✓
Singapore	✓
South Africa	✓
U.K.	✓
U.S.	✓

Common Algorithms

Implementation Shortfall	✓
Pairs	✓
Percent of Volume (POV)	✓
TWAP	✓
VWAP	✓

Concepts

Dark Pool Aggregator	Pragma's dark pool aggregator, OnePipe, is one of the leading products in the industry, connecting to over 30 dark pools with an average fill rate of 65%.
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Company

Pragma Trading/Weeden & Co.

Department/Division

Electronic Trading Products

Service or Product

Algorithmic Trading

Number of Clients

1500+

Website

www.pragmatrading.com/products/algorithms, www.weedenco.com/electronic-trading/overview.php

Claimed Feature(s)

- Weeden's substantial investment in proprietary trading tools, dark pool connections, and algorithms result in lower latency and higher cross rates for clients.
- Integration of high-touch human experience with low-touch implementation strategies.
- Sales and position traders interact creatively with block trades, resulting in industry leading cross ratios and lower impact costs.
- No proprietary trading department. We are 100% focused on the Institutional client, and on providing the highest quality execution attainable.

Claimed Advantage(s)

- Weeden & Co. was ranked #1 in the Greenwich Associates 2010 US Equity Trading Survey in the following categories: #1 Best Advice on Implementation Strategy, #1 Best at Minimising market Impact and #1 Capability of Sales Professionals

Special Facilities

- Smart Order Routing • TCA • DMA

Asset Classes

- Equities • Fixed Income

Contact

U.S. Headquarters

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Quantitative Brokers

Quantitative Brokers (QB) specialises in execution algorithms that have been custom-built for the interest rates market. Each of the three flagship algorithms – Bolt, Strobe, and The Roll – focus on optimal order book placement and reduction of slippage costs. The algorithms dynamically position orders based on pro-rata and FIFO passive fill probabilities, calculate the presence of hidden and implied liquidity, and utilise

real-time co-integration signals from the entire rates curve.

QB emphasises open collaboration with its clients and will work with them to create a flexible algorithmic solution. The broker believes that clients need to fully understand both the analysis and technology behind its algorithms, therefore transparency of its models is of utmost importance. QB provides detailed transaction

Description of Algorithms

Bolt

Ideal for urgent orders of durations up to 30 minutes, Bolt aims to beat the bid-offer midpoint at the time the order is received. Bolt leverages Quantitative Brokers proprietary pro-rata and FIFO order placement techniques and uses cointegration signals from related instruments to detect pricing discrepancies. Bolt also intelligently works the order book to collect spread when possible and can be used on outright, spreads, butterflies, packs and bundles.

Strobe

Ideal for large orders that can be worked for 30 minutes or longer, Strobe aims to beat the time or volume weighted average price. Strobe leverages Quantitative Brokers proprietary pro-rata and FIFO order placement techniques and uses cointegration signals from related instruments to detect pricing discrepancies. Strobe also continually readjusts order size and price to passively collect spread, and can be used on outright, spreads, butterflies, packs and bundles.

The Roll

The Roll algorithm is designed specifically for trading the US Treasury futures roll and aims to beat the time or volume weighted average price. The Roll intelligently tracks the low-volatility, long-queue characteristics of the roll market and analyzes historical and real-time market signals to determine the optimal time to roll. The Roll also tracks cheapest to deliver sensitivities and dynamically sizes child orders in line with the market in order to maximize the fill ratio. Finally, The Roll can continually readjust resting order size and price to passively collect spread.

cost analysis on every order as well as periodic quantitative microstructure research.

QB is an agency-only executing broker that does not engage in any proprietary trading. All orders are transmitted anonymously, so information leakage is not a concern. Trading with QB requires no software, licenses, or up-front costs.

QB's production infrastructure is proximity

hosted at each supported exchange and uses only the latest technology for its high-frequency algorithmic development and data analytics.

The algorithms can be accessed via FIX, proprietary systems, or any requested vendor EMS/OMS. Customers may clear their trades with any FCM or clearing broker of choice. QB serves a range of institutional clients, including CTAs, hedge funds, banks and traditional asset managers.

Common Algorithms

Bloomberg	✓
Flextrade	✓
Portware	✓
Other	✓

Markets

United States	✓
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Concepts

Pro-rata order placement

Full Transparency	Post-trade reports charting what child orders were placed and where in the order book
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Cointegration model

Designed for the "Bolt" and "Strobe" algorithms for clients trading Eurodollar futures, the model monitors the prices of the front two years of the Eurodollar complex to look for short-term departures from equilibrium. It then generates a price prediction signal for each individual Eurodollar contract, which is dynamically updated throughout the trading day and applied to the algorithms' real-time order placement logic.

Company

Quantitative Brokers

Department/Division

N/A

Service or Product

Fixed Income Execution Algorithms

Launch Date

2010

Website

www.quantitativebrokers.com

Claimed Feature(s)

- Pro-rata order book placement techniques.
- Account and Instrument level Pre-trade Risk Controls.
- Interest Rates Market Microstructure expertise.

Claimed Advantage(s)

- QB conducts no proprietary trading - agency only.
- All models are built exclusively for Interest Rates
- Co-integration price-prediction model from neighboring yield curve prices.
- 100% of infrastructure and algos are hosted at the exchange for lowest latency.
- Flexible connectivity options to any additional client requested interfaces.

Special Facilities

- Independent floor brokerage/ agency only.
- FCM neutral - clients can clear with any clearing broker they choose.

Asset Classes

- Fixed Income
- Futures (Fixed Income Futures only)

Contact

Sales

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RBC Capital Markets

RBC Capital Markets (RBCCM) is a full service investment bank that provides a focused set of global products and services to institutions, corporations, governments and high net worth clients worldwide. With over 3,300 professionals, RBCCM provides capital markets products and services from 75 offices in 15 countries and works with clients through operations in Asia,

Australia, UK and Europe and every major North American city.

RBC Capital Markets Global Electronic Execution Group provides intelligent trading solutions designed to help clients navigate the complexities of today's marketplace. RBC's capabilities feature proprietary algorithms integrated with patent-pending THOR™

Concepts	
Thor	Thor is RBC Capital Markets' patent-pending smart order routing technology, specifically designed to minimise latency-based information leakage and improve execution quality in North American markets.
CSOR	CSOR is RBC Capital Markets' smart order routing technology for interlisted securities in the U.S. and Canada. Leveraging THOR technology and real-time FX quotes, CSOR determines the best execution market while reducing FX settlement risk
RBC Dark	RBC Dark is a sophisticated dark pool aggregator designed to access liquidity from multiple destinations using advanced analytics and anti-gaming strategies.

Description of Algorithms	
RBC NOW	An aggressive liquidity seeking algorithm that efficiently completes an order while managing market impact.
RBC Eclipse	Uses stock-specific triggers to opportunistically source liquidity. The algorithm is well suited for small- and mid-cap names.
RBC Select	Uses a client's aggressiveness tolerance to select the execution style and timing.

technology and a team dedicated to delivering best execution. Both workflow and liquidity-seeking algorithms were built organically from RBC's market structure research and deep market knowledge. These strategies are continually evolving in response to regulatory and market microstructure changes. RBCCM is integrated with all major front ends globally and is able to integrate quickly with proprietary systems.

RBC's execution quality has been recognized in multiple studies conducted by Quantitative Services Group (QSG®), a leading, independent trading analytics firm. When measured against other leading brokers, RBC outperforms in QSG's cutting edge metrics, such as Order vs. Overall Adverse Ticks. To help clients

measure improved execution quality resulting from THOR routing technology, RBC partnered with a QSG to develop TCAP™, a metric which compares the difference between displayed

Markets

Australia	✓
Austria	✓
Belgium	✓
Canada	✓
Denmark	✓
Finland	✓
France	✓
Germany	✓
Italy	✓
Netherlands	✓
Norway	✓
Portugal	✓
South Africa	✓
Spain	✓
Sweden	✓
Switzerland	✓
U.K.	✓
U.S.	✓

Common Algorithms

Implementation Shortfall	✓
Percent of Volume (POV)	✓
TWAP	✓
VWAP	✓

Company

RBC Capital Markets

Department/Division

Global Electronic Execution

Service or Product

Algorithmic trading strategies, DMA and Thor smart order routing technology

Launch Date

Re-released in 2009

Website

www.rbccm.com/thor

Claimed Feature(s)

- All algorithms leverage patent-pending Thor smart order routing technology.
- Market Structure Strategy Experts – RBC electronic trading is focused on innovation, leveraging robust knowledge of current issues in electronic markets, market micro structure and high frequency trading.
- Unique products designed to give RBC's clients true execution quality and the tools with which to evaluate their executions in a meaningful way.

Claimed Advantage(s)

- Client-first focus emphasises execution quality and client service.
- Thor smart order routing technology results in higher fill rates and improved execution quality.
- Innovative new trading benchmarks, such as TCAP Ratio, provide execution quality transparency beyond traditional industry measures.

Special Facilities

- Smart Order Routing (Thor) Algo Customisation.

Asset Classes

- Equities



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liquidity at the time of the routing decision to the actual execution size.

In addition, RBC recently launched an Electronic Trading Strategy group to focus on researching the timeliest issues in the electronic market and how

those issues impact our institutional clients. The group provides clients with unique insight into evolving market trends, market regulation, high frequency trading, and market microstructure.

Interfaces

Advent	✓
Bloomberg	✓
Charles River	✓
ConvergEx	✓
Fidessa LatentZero	✓
Flextrade	✓
InfoReach	✓
Instinet	✓
IRESS	✓
ITG	✓
Ivory	✓
JP Morgan	✓
Knight Direct	✓
Linedata Longview	✓
Mixit	✓
Portware	✓
REDI	✓
Reuters RTEX	✓
SunGard Global Trading	✓
Townsend Analytics	✓
TradingScreen	✓

RBS

DMA and DSA are a fundamental offering within the Equity Execution Services (EES) group at RBS. EES is dedicated to providing a global service in Portfolio and Electronic Trading, as well as Delta 1 products such as ETFs, Swaps and Certificates. In addition to providing execution and structuring, we have a team of sophisticated Quant and Index Analysts who provide value-added input to our clients in a solutions-based approach which complements our existing equities franchise.

we achieve through superior Execution Risk management (while still providing value added trading calls) and in maximising our participation across all available liquidity (both Lit and Dark Pools).

EES is one half of a combined group known as Equity Delta 1 and Financing (EDF). This team represents one of three Value Centres within the Equities business alongside Core Equities and Equity Derivatives. Together with Equity Finance and Collateral Trading (EFCT), we represent an ideal partner to all our clients, be they Long Only Mutuals and Pensions, Hedge Funds, Insurance Companies, Sovereign Wealth and Private Banks. We leverage our Quant Alpha, good quality Execution, Comprehensive

Concepts

Extensive anti-gaming logic

PESO – Pre-emptive Strike Orders

Golden POV

EES operates as a single Global Team and platform. This provides us with the flexibility to offer our clients a customised 24-hour service. We demand the most advanced technology and best-in-class execution. This

Description of Algorithms

Chameleon	An aggressive algorithm that utilises RBS's proprietary short-term alpha model to search for and trade liquidity across all available execution venues (both lit and dark) to complete the order with minimum information leakage/market impact using the full range of order types including IOC and non-displayed types.
Dark Only	Trades exclusively on dark venues and order books supporting hidden orders. The entire order is sent to each venue in turn based on historical liquidity patterns to establish if and where the hidden liquidity is residing, with any remaining balance split across the available venues again biased towards historical liquidity. Orders will be redirected to any venue(s) showing signs of activity.
Target Price	A flexible strategy that allows the trader to define a range of POVs that are used when certain price targets are met.

>>

Company

RBS

Department/Division

Equity Delta 1 & Financing

Service or Product

Electronic Trading

Website

www.rbsm.com/edf

Claimed Feature(s)

- Total anonymity. • Execution venue transparency. • Proprietary short-term alpha model. • Proprietary SOR. • Access to all main execution venues, lit and dark. • Integrated with all main vendors. • Get Done and Get Done In Dark. • Sophisticated anti gaming logic. • Access via Multiple front ends. • RBS Cross

Claimed Advantage(s)

- Analytics. • Client focus - dedicated e-sales trading desk. • Flexibility. • Dedicated Quant teams constantly analysing performance to improve strategy behaviour. • Execution Consultancy. • Customisation through Quant team interaction.

Special Facilities

- DMA • Smart Order Routing • STP Analytics - scheduled and bespoke

Asset Classes

- Equities

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Liquidity access and structuring expertise, coupled with Stock Borrow/Loan, Yield Enhancement, Financing and Synthetic Prime Brokerage capabilities to service our clients' needs.

Interfaces

Bloomberg	✓
Charles River	✓
ConvergEx	✓
EZX	✓
Fidessa LatentZero	✓
Flextrade	✓
GlobalLink	✓
Inforeach	✓
ITG	✓
JP Morgan	✓
Linedata Longview	✓
LSE	✓
Portware	✓
REDI	✓
Reuters	✓
SunGard Global Trading	✓
Thinkfolio	✓
Tora	✓
Tradeware	✓
Tradeweb	✓
Trading Screen	✓
Ullink	✓
Visual Trader	✓

Markets

Austria	✓
BATS Europe	✓
Belgium	✓
Chi-X	✓
Czech Republic	✓
Denmark	✓
France	✓
Germany	✓
Hong Kong	✓
Japan	✓
NASDAQ OMX Europe	✓
Netherlands	✓
Portugal	✓
Singapore	✓
Smartpool	✓
South Korea	✓
Spain	✓
Sweden	✓
Swiss Block	✓
Switzerland	✓
Taiwan	✓
Turquoise	✓
U.K.	✓

Common Algorithms

Implementation Shortfall	✓
Inline	✓
Market on Close	✓
Peg	✓
TWAP	✓
VWAP	✓

Sanford C. Bernstein

Sanford C. Bernstein LLC and its affiliates provide global high quality fundamental research, strategy, and unconflicted execution and brokerage services to institutional clients, as well as equity capital markets services to corporate issuers. Bernstein has offices in New York, Los Angeles, London, Stockholm, Zurich and Hong Kong, facilitating equity execution in more than 40 countries worldwide. Execution services include sector trading, portfolio trading, algorithmic

trading, direct market access and US-listed options.

Sanford C. Bernstein delivers superior global equity execution with the focus on client performance, service and transparency. Sanford C. Bernstein's algorithmic offering comprises a comprehensive suite of trading strategies, developed in-house, that maximises access to all available sources of visible, grey and dark liquidity dynamically reacting to market conditions. Bernstein's team of

Description of Algorithms

CashFall	Portfolio level implementation shortfall, aggression defined by the user.
In Line	Intelligent scaling in a non linear manner attempting to beat the strike price, varying levels of aggression.
Ninja	Opportunistic liquidity aggregation maximising access to both dark and visible liquidity while controlling the level of information disseminated to the market, no orders are posted to the order book. Aggression is user defined.
Shadow	Passive Liquidity Aggregation utilising multiple dark venues and Bernstein's own agency-only liquidity pool, will not access displayed liquidity.
Would or Work	Two stage customized executions, aggressive within a narrow range of the strike price, if the stock moves away then work with volume.
Participate	Executes order at user specific level of market volume with the option to vary aggression based on price movement.
Price Capture	Implementation shortfall with varying levels of aggression.
Passive	Designed to execute liquid orders that are a low percentage of average daily volume. A patient strategy, Passive will spread the orders over a longer period with the aim of seeking an optimal execution level.

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Company

Sanford C. Bernstein

Department/Division

Portfolio and Algorithmic Trading

Service or Product

Portfolio and Algorithmic Trading

Launch Date

U.S. 2001, Europe 2008

Number of Clients

>500

Website

www.bernsteintrading.com

Claimed Feature(s)

- Execution monitoring and advice provided by experienced traders with many years experience.
- Unique liquidity management and routing.
- Sophisticated short-term alpha modelling.
- A dedicated quantitative team to focus on performance and customisation on strategies.

Claimed Advantage(s)

- Uncompromised equity execution, operating only on an unconflicted basis with no preference to internal liquidity.
- Advanced execution monitoring to ensure quality and transparency of execution.
- Robust, reliable infrastructure with multiple routes to market.
- Our responsiveness to any client requests is what we are most proud of.

Special Facilities

- DMA
- Smart DMA
- Customisation

Asset Classes

- Equities

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quantitative experts have advanced measures in place to optimize venues selection and limit the possibility of orders being gamed. Algorithmic orders are monitored by experienced traders who are able to provide a personalised service and advice on recommended trading style or algo selection. Upon request traders can take control of specific orders.

As part of the initial set up and ongoing dialogue, client profiles are amended to reflect their view on trading venues, trading risk limits, dark pool and grey pool selection, and participation in auctions. For European algorithms, Bernstein offers the choice of tracking and benchmarking against the primary market or consolidated market. If Bernstein's algorithmic suite does not completely satisfy

Concepts

Unique Aggression Parameter

Many of the Bernstein trading strategies are available with Bernstein's unique aggression parameter. User defined the aggression parameter allows the algorithm to determine optimum level of interaction with the market incorporating the traders view, individual stock level characteristics and current market dynamics. Proprietary modelling of short term alpha and the dynamic use of all available forms of dark and hidden liquidity ensures execution strategies are reactive to current market conditions, maximising performance while limiting risk and signalling to the market.

Cash Balance

Many of the Bernstein single stock algorithms can now be linked with similar strategies for the purpose of cash balancing across two or more orders.

Common Algorithms

Close	✓
Participate	✓
Price Capture (Implementation Shortfall)	✓
Smart DMA	✓
TMX (Time Slice)	✓
VWAP	✓

Markets	
Austria	✓
Belgium	✓
Brazil	✓
Canada	✓
Czech Republic	✓
Denmark	✓
Finland	✓
France	✓
Germany	✓
Greece	✓
Hungary	✓
Ireland	✓
Israel	✓
Italy	✓
Mexico	✓
Netherlands	✓
Norway	✓
Poland	✓
Portugal	✓
South Africa	✓
Spain	✓
Sweden	✓
Switzerland	✓
Turkey	✓
U.K.	✓
U.S.	✓

your trading requirements, our team of quantitative developers are able to work with you to provide a unique customised solution. Examples of previous customised solutions include automated switching between strategies, strategy selection based on security characteristics or market conditions, constraining venue or style selection and benchmarking against another security.

Our quant team is also available to provide a full review of your previous electronic orders directed to Bernstein and assess the

effectiveness of current strategy selection and recommend alternative trading styles. Bernstein is consistently among the most highly ranked independent sell-side research teams, according to industry surveys conducted by third-party organizations. Bernstein provides bottom-up coverage and portfolio strategies supported by sophisticated quantitative tools and is dedicated to maximizing client trading performance through the pursuit of best-in-class execution.

Interfaces	
Bloomberg	✓
Charles River	✓
ConvergEx	✓
Fidessa LatentZero	✓
Flextrade	✓
ITG	✓
Linedata Longview	✓
Portware	✓
SunGard Global Trading	✓
Real Tick	✓
REDI	✓
Trading Screen	✓

**Societe
Generale**

Societe Generale's electronic trading activities are managed within its Global Equities and Flow department, part of the SG Corporate & Investment Banking division. Societe Generale is a leading player in the equity derivatives market globally, with two-thirds of the overall structured products business in Europe. Societe Generale offers Electronic Services in equities, fixed income and FX and will shortly be introducing equity futures and options. The electronic trading team claims to gain competitive advantage from the deep quantitative engineering skills of the bank

adapted for client trading. Within the Global Equities and Flow department, the cash equities brokerage offers two separate capabilities: research and execution. Execution consists of sales trading, where Societe Generale acts as facilitator, offering high-touch trading, crossing, and liquidity for buyers and sellers for block trades; program trading; and electronic trading, through direct access to liquidity pools. Approximately 85% of GEDS' program trading is executed through algorithms, with traders monitoring baskets to

Description of Algorithms	
Eclipse	This strategy is an aggressive liquidity seeking strategy that executes quickly up to the limit price. Designed to work in stealth mode, it will only hit bids and never quotes, thus reducing signalling risks, with advanced anti-gaming features. Eclipse prioritises the SG CIB Alpha-X crossing service, and external dark pools. Aggression levels and % of volume limits are fully customisable.
Relative Value	RV emphasises SG CIB's real time fair value model by adjusting trading participation rates dynamically depending on the value of the share price relative to other sector or index constituents. The user can select to CUT or RUN the position by increasing or decreasing participation when market price is favourable versus the selected benchmark index. RV uses a curve determined by user defined minimum and maximum participation rates so that aggression adjusts smoothly within minimal impact.
Pairs Trading	Pairs Trading is a program trading algorithm which is designed to trade multiple contingent orders. The user can select ratios, spreads and also set up formulas. A dedicated support desk is available to help with the use of Pairs Trading strategies and provide switch ideas.

ensure that only appropriate trades are processed through its models, which offer consistent access to all available markets.

The group's algorithms have been developed to incorporate the financial engineering models generated by its statistical arbitrage business over a decade of trading. A major advantage is that the algorithms can access the internalisation engine known as 'AlphaX', which crosses only client natural

liquidity and principal flows generated off the back of

Common Algorithms

Implementation Shortfall	✓
VWAP	✓
With Volumes	✓
Market on Close	✓
Market on Open	✓
Peg	✓
TWAP	✓
Pairs	✓
Eclipse (liquidity seeker)	✓
Relative Value	✓

Interfaces

Bloomberg	✓
Charles River	✓
ConvergEx	✓
Fidessa LatentZero	✓
FlexTrade	✓
InfoReach	✓
Instinet	✓
ITG	✓
Linedata Longview	✓
Portware	✓
REDI	✓
Reuters	✓
SunGard Global Trading	✓
Tora	✓
TradeWare	✓
Tradeweb	✓
Trading Screen	✓
Ullink	✓

Company

Societe Generale

Department/Division

Global Equity Flow (GEF)

Service or Product

Global Execution Services

Launch Date

2005

Website

www.sgcib.com
www.execution.socgen.com

Claimed Feature(s)

- Global coverage and 24 x 5 coverage (4 trading desk) with comprehensive access to Emerging Asia, LatAm and EEM alongside world developed markets.
- Advanced algorithms developed using highly quantitative trading techniques based on statistical relative valuation.
- Access to Alpha-X crossing engine providing internal liquidity pool which brings together client and in house flows.

Claimed Advantage(s)

- Substantial liquidity via SG's large market share and the Alpha-X crossing engine.
- High levels of customisation – client trading styles can be profiled using over 50 parameters that can be altered in real time by the SG CIB trading desks while maintaining a simple client front end.
- Simple, easy to understand algorithms with outstanding performance and high levels of customisation available.
- Ability to 'Store and Forward' overnight orders for remote regions (e.g. US into APAC).

A-TEAM INSIGHT RESEARCH

Expanding Global Identifiers in Complex Assets and Other Areas

In the post-credit crisis financial services industry, risk management, compliance and transparency have emerged as focus points for review with provision of accurate and timely data recognised as a critical element of success. Fundamental to data provision is the accurate identification of both financial instruments and counterparties – without which you cannot truly measure your performance or exposure.

Rapid growth in derivatives and securitised debt instruments played a central role in the credit crisis. In the aftermath of the crisis, the use of alternative asset classes has continued to grow. In order to ensure that an individual firm's exposure through such complex instruments can be accurately measured, and therefore, managed, that firm must be able to correctly identify the securities and the entities that they are investing in.

This can only be done through the use of unique identifiers. But it is a well known fact that there is no single identifier capable of uniquely identifying securities or entities globally. While there are countries with identifier schemas, or certain asset classes such as equities that are well covered, there are many regions, asset classes, and markets that do not have a robust mechanism for identifying securities and entities. Despite significant effort, the industry has not been able to progress a standardised approach to this problem.

Is there another way? Can commercial initiatives and innovation through partnerships succeed where standards bodies have so far failed?

We examine the industry requirements and complexities inherent in the application of unique identifiers in three key areas: Business Entity Identifiers, US Listed Options and Syndicated Loans and review the collaborative approach taken by Standard & Poor's CUSIP Global Services to develop innovative and comprehensive industry solutions.



Download this special report for FREE now!
www.a-teamgroup.com/rdr-research

Interested in participating in the series? **Contact:** martyn.hodges@a-teamgroup.com

>> facilitation and risk portfolio trading. The algorithms make comprehensive use of market price indicators, monitoring them in real time and reacting to movements in the sector, index, volatility, spreads and other key statistical indicators.

Smart routers are used in Europe and North America. The bank believes clients are growing weary of the arms race among sell-side algorithmic model providers and aims to keep things simple.

Markets

Argentina	✓	Jordan	✓
Australia	✓	Malaysia	✓
Austria	✓	Mexico	✓
Belgium	✓	Morocco	✓
Brazil	✓	Netherlands	✓
Canada	✓	New Zealand	✓
Chile	✓	Norway	✓
China	✓	Pakistan	✓
Columbia	✓	Peru	✓
Czech Republic	✓	Philippines	✓
Denmark	✓	Poland	✓
Egypt	✓	Portugal	✓
Finland	✓	Singapore	✓
France	✓	SIX	✓
Germany	✓	South Africa	✓
Greece	✓	South Korea	✓
Hong Kong	✓	Spain	✓
Hungary	✓	Sri Lanka	✓
India	✓	Sweden	✓
Indonesia	✓	Taiwan	✓
Ireland	✓	Thailand	✓
Israel	✓	Turkey	✓
Italy	✓	U.K.	✓
Japan	✓	U.S.	✓

Special Facilities

- 'Eclipse' algorithm providing aggressive liquidity-seeking strategy utilising all pockets of liquidity.
- 'Block Cross' mechanism allows automated block crossing of algorithmic trading order if liquidity appears in Alpha-X or external dark pools.
- 'Would' behaviour in all algorithms accelerates or decelerates trading participation depending on client selections.
- Direct Capital Access offering in 2000+ European names.
- Smart Order Routing functions built into the algorithms allows intelligent and dynamic selection of venues.
- Specialisations on LATAM and India algos.

Asset Classes

- Equities • Equity Derivatives • Fixed Income • FX

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UBS

UBS Direct Execution is UBS's global institutional electronic trading business. Direct Execution offers direct market access (DMA), a suite of advanced algorithmic trading strategies, the UBS Pinpoint execution management system and the UBS Fusion web-

based analytics platform. Launched in 2007, UBS Fusion provides clients with a flexible set of pre-, at-, and post-trade analytics and tools, including Real-Time TCA.

Additionally, UBS provides access to its own UBS Price Improvement Network

Description of Algorithms

TapNow	A very aggressive liquidity-seeking strategy which aggregates liquidity across displayed markets and non-displayed venues.
Tap	Simultaneously seeks liquidity in both displayed and non-displayed markets, based on your Urgency setting and parameters.
Pairs	Executes two stocks simultaneously, while monitoring prices for each and trading only when the target spread can be achieved.
Perimeter	Enables trading outside of regular US market hours: pre-open, post-close, in auctions and imbalances. Available from 7:30am-5:30pm
Custom	All strategies may be customized so the behaviour meets the client's preferred trading style or unique objectives. We also build bespoke custom algorithms to suit client's specific needs.
Options Delta Adjust	Dynamically adjusts the limit price of your options order based on the specified Delta (D) and the price of the underlying security.
Options TWAP	Releases orders into the market at an even pace over a specified period of time, with a parameter for delta to manage deviation.
Options Trigger	Holds your options order off the exchange until the market price of the underlying security reaches your Maximum or Minimum Price.
Options Scale Trigger	Will not execute unless the market price of the underlying security is between your Maximum and Minimum Prices.
Options Premium Trigger	Allows you to place an options order that is dependent on the price of the option premium, instead of the price of the underlying security.
Options TapNow	Allows you to place an options order that is dependent on the price of the option premium, instead of the price of the underlying security.
Options Hidden	Holds your order off the exchange until your desired price is available. It then sends waves of Immediate or Cancel (IOC) orders to the market to participate at that price, continuing the cycle until your order is complete. >>

(PIN) liquidity pool, as well as connectivity to markets worldwide. With access to over 130 exchanges and alternative liquidity venues, UBS trades equities in each region of the globe.

Headquartered in Zurich and Basel, Switzerland, UBS is a global firm providing services to private, corporate and institutional clients. Its strategy is to focus on international wealth management and the Swiss

banking business alongside its global expertise in investment banking and asset management. In Switzerland, UBS is the market leader in retail and commercial banking.

UBS is present in all major financial centres worldwide and has offices in over 50 countries. Its shares are listed on the SIX Swiss Exchange, the New York Stock Exchange (NYSE) and the Tokyo Stock Exchange (TSE).

Concepts

Strategies that think like a trader

We've created a suite of highly self-adaptive algorithms that not only seek liquidity and price improvement, but also use advanced logic to safeguard your order from gaming and negative selection

Common Algorithms

At Close	✓
At Open	✓
Float	✓
Hidden	✓
Implementation Shortfall	✓
Price Inline	✓
TWAP	✓
Volume Inline	✓
VWAP	✓

Company

UBS Investment Bank

Department/Division

UBS Direct Execution

Service or Product

UBS DMA, Algorithmic Trading, UBS Fusion and UBS Pinpoint

Website

www.ubs.com/directexecution

Claimed Feature(s)

- High capacity, state-of-the-art technology that is faster and smarter.
- Innovative algorithms that think like a trader.
- Analytics that deliver precision and transparency in real time.
- Access to quality liquidity in more than 130 markets worldwide.
- Portfolio, single stock, options, futures, FX and cross-asset trading capabilities all on the same platform.

Claimed Advantage(s)

- Trading experts on call to provide execution consulting and market expertise in major markets around the world.
- Completely confidential order and execution information both inside and outside UBS.
- Efficient access to deep, diverse liquidity, both displayed and non-displayed, around the globe.
- Agility, flexibility, and customization of algorithms, analytics and execution management systems.

Special Facilities

- Smart Order Routing
- Direct Market Access (DMA) with Smart Order Routing
- HV (High Volume) DMA
- Broker Execution Services
- Advanced analytics via UBS Fusion, including Real-Time TCA
- UBS Pinpoint, our cross-asset EMS

Asset Classes

- Equities
- Futures
- Options
- FX

>>

Description of Algorithms (cont.)

Options Float	Allows you to float your order in the market, in reference to the passive side of the spread. Use the Discretion parameter to specify an offset.
Futures VWAP	Seeks a volume-weighted average series of executions for your order.
Futures TWAP	Releases orders into the market at an even pace over a specified period of time.
Futures Float	Floats orders in the market, in reference to the spread in a contract.
Futures Hidden	Holds your order until your desired price is available, then sends waves of Immediate or Cancel (IOC) orders to the market to participate at that price.

Markets

Alpha ATS	✓ GETCO	✓ NYSE ARCA Europe	✓
Aqua ATS	✓ Greece	✓ Poland	✓
ATD	✓ Hong Kong	✓ Portugal	✓
Australia	✓ Hungary	✓ Sigma X	✓
Austria	✓ India	✓ Singapore	✓
Barclays Liquidity Cross (LX)	✓ Indonesia	✓ NYSE Euronext Smartpool	✓
BATS (BZX, BYX & Europe)	✓ Instinet CBX & Intraday	✓ South Africa	✓
Belgium	✓ Ireland	✓ South Korea	✓
BIDS	✓ Israel	✓ Spain	✓
Block Cross (U.S.)	✓ Italy	✓ Sweden	✓
Bloomberg Tradebook	✓ Japan	✓ Switzerland	✓
BNY Vortex	✓ JapanNext	✓ SWX Swiss Block	✓
Brazil	✓ Kabu.com	✓ Taiwan	✓
Burgundy	✓ Knight Link	✓ Thailand	✓
Canada	✓ Knight Match	✓ Track ECN	✓
Chi X (Canada, US and Europe)	✓ Korea	✓ Turkey	✓
Chi-Delta	✓ LavaFlow	✓ Turquoise	✓
Chi-X Japan	✓ Level	✓ UBS ATS	✓
Czech Republic	✓ Malaysia	✓ UBS MTF	✓
Denmark	✓ MatchNow	✓ UBS PIN	✓
DirectEdge (EDGA/EDGX)	✓ Mexico	✓ U.K.	✓
Fidelity CrossStream	✓ Millenium	✓ U.S.	✓
Finland	✓ MS Pool	✓ XIM	✓
France	✓ Netherlands	✓	
Germany	✓ Norway	✓	

Interfaces

Advent	✓	MIXIT	✓
AFA	✓	NeoNet	✓
Block Orders Execution	✓	Nirvana	✓
Bloomberg	✓	NRI	✓
Charles River	✓	ORC	✓
Citi	✓	Paladyne	✓
ConvergEx	✓	Peresys	✓
ESP	✓	Portware	✓
EZX	✓	REDI	✓
Fidessa LatentZero	✓	Reuters (RTEX)	✓
Flextrade	✓	SimCorp	✓
InfoReach	✓	SunGard Global Trading	✓
Instaquote	✓	Tethys	✓
Instinet	✓	ThinkorSwim	✓
ITG	✓	Tieto (ProBroker)	✓
Ivory	✓	Tora	✓
JP Morgan	✓	Townsend Analytics	✓
Knight-Direct	✓	TradeWeb (ATR/Autex)	✓
Linedata Longview	✓	Trading Screen	✓
Liquidity Book	✓	ULLINK	✓
LSE Hub	✓	UNX	✓
Metabit	✓	Visual Trader	✓

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A-TEAMGROUP

About A-Team Group

A-Team Group, founded in 2001, provides a range of global online news, in-depth research reports, and events focused on the business of financial information technology.

A-Team Group serves its global client base of IT and data professionals within financial institutions, technology and information suppliers, consultants and industry utilities with insight into the business of electronic trading, market data, low latency, reference data, risk management and the impact of regulation upon these industry segments.

Our flagship news and analysis service is A-Team Insight, with the best of A-Team's coverage of the Electronic Trading, Low-Latency Connectivity, Market Data, Reference Data and Risk Management Technology segments. With in-depth features and interviews with key newsmakers, **A-Team Insight** gives busy financial IT executives all they need to know to stay on top of our fast-moving industry via regular updates on our website and a monthly PDF digest format.

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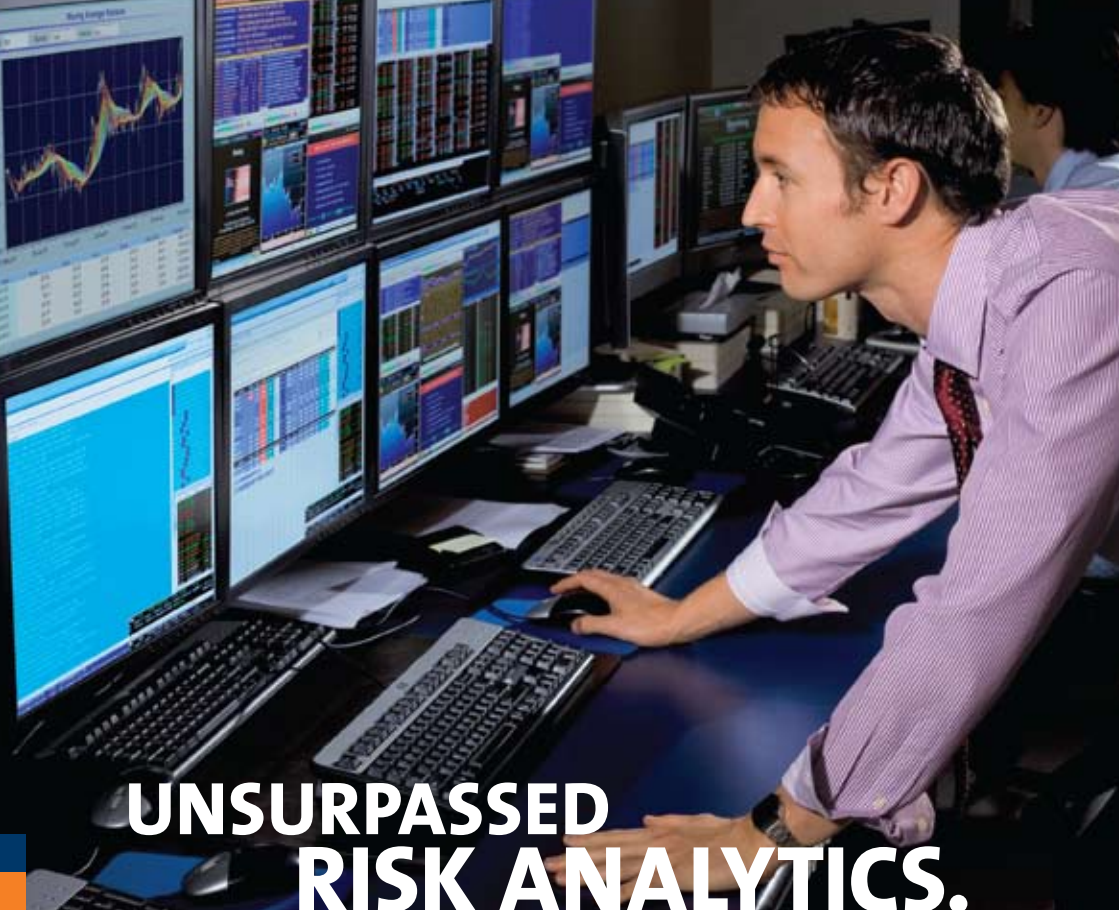
A-Team Group's research division provides industry professionals with focused and in-depth research offerings to better understand the specific uses of data and technology in today's trading and investment processes across the financial enterprise from front to back office. These include a series of topical white papers, survey-based research reports and focused directories (eg: algorithmic trading, valuations and alternative trading systems directories). Many of A-Team's research publications are available for free at: **www.A-TeamGroup.com/site/research**.

A-Team offers custom research solutions, commissioned by clients seeking answers to specific questions for in-house product development or marketing, or looking to support their marketing activities, promote thought leadership and generate sales leads. Find out how our custom research solutions can boost your marketing campaigns by contacting A-Team Group.

A-Team Group's events division produces a series of Insight events annually. These events combine A-Team's expertise in financial markets IT with thought leadership from world-class technology innovators and practical experience from financial market practitioners. For a schedule and more information, visit: **www.A-TeamGroup.com/Insighevents**.

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For more information about A-Team Group, visit **www.A-TeamGroup.com**.



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SYBASE RAP – THE TRADING EDITION GETS YOU MORE OF THE BEST DATA, FASTER.

These days, the difference between winning and losing often comes down to who analyzes and acts on their information first. That's why you need Sybase® RAP – The Trading Edition®. This powerful market analytics platform delivers the real-time market data your business demands. Along with the Continuous Intelligence™ you need to make smarter, faster decisions. Because, when seconds count, the best data wins every time.

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F Strength in breadth

Fidessa systems are trusted because they work, and – just as important – they work together. We understand what the buy-side needs and what the sell-side wants, and our solutions span every possible aspect of the trading and investment process. With 30 years of experience, 1,600 expert professionals and operations across Europe, the Americas, Asia Pacific and the Middle East, you can trust us to keep you trading, 24/7.

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Fidessa
Trade/Invest/Inform