



FIS' Valdi

Listed Derivatives Trading Technology

Overview

The drive for greater efficiency is relentless in a highly competitive market environment with commissions and margins under constant pressure.

Traders face enormous challenges in maintaining and growing their profitability in an uncertain market. Firms face demands for greater transparency and the need to remain compliant with regulatory change. While at the same time the trend towards competition between trading venues is being driven by lower transaction volumes and compressed margins. As a result, many firms are reappraising their technology to help them forge greater internal efficiencies, using faster modern next generation technology to seize the growth opportunities that a dynamic listed derivatives market presents.

FIS' Valdi for listed derivatives

Only high-powered capabilities will help keep firms in the lead with smart technology for listed derivatives, equities and futures trading. **FIS' Valdi** provides firms with greater flexibility, connectivity and real-time speed. Valdi helps address the electronic trading challenges for sell-side listed derivatives and equity businesses and helps them remain competitive in uncertain markets.

In an increasingly complex market Valdi helps firms simplify their technology requirements by providing a flexible, cost-effective solution. The Valdi solution architecture delivers tailored functionality specific to listed derivatives trading that is also available through managed services. Firms can rely on the strength of client service and technology that FIS provides to focus on their core competences. This is why many of the world's leading FCM's (futures commissions merchant), brokers and other market participants are our clients.

Key benefits

- Client application and broker connectivity to global derivatives markets via FIX, the FIS Global Network and the Valdi trading suite
- Advanced derivatives-specific execution capabilities at workstation level
- Flexible, high-capacity order management system
- Suite of building blocks, tools and services for algorithmic trading
- Precisely configurable pre-trade risk management, integrable across diverse trading platforms
- High-performance gateways for direct member access to 70+ derivatives markets worldwide
- Managed services for flexibility and cost-effective business support.

Valdi suite features

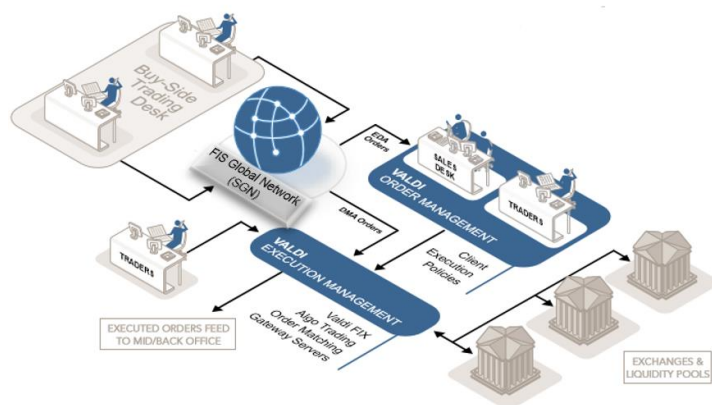
Valdi is an integrated and modular offering that provides:

- Client application and broker connectivity to global derivatives markets via FIX, the FIS Global Network (SGN) and Valdi trading workstations
- Advanced derivatives specific execution capabilities at workstation level
- Flexible, high-capacity order management system
- Powerful algorithmic, spread and strategy trading tools
- Precisely configurable pre-trade risk management, integrable across diverse trading platforms
- High-performance gateways for direct member access to 70+ derivatives markets worldwide
- Modular platform that can be delivered as a fully hosted and managed service.

All the above capabilities can be delivered as managed services.

Valdi order flow

CLIENT CONNECTIVITY - MARKET DATA - ORDER MANAGEMENT - ADVANCED EXECUTION



Order Flow Diagram

Client and application connectivity

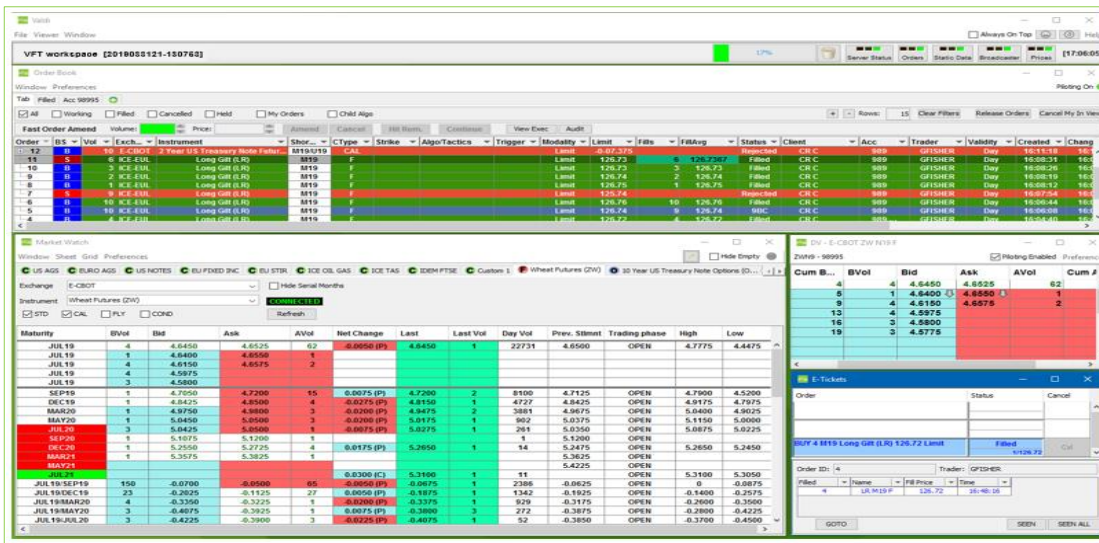
Valdi supports trading on all listed asset classes across an unrivalled range of electronic markets: over 170 globally. The core order and execution management functions are supported coherently via process 'blades' on the high-capacity Valdi Core Server.

Valdi provides all the data for electronic trades and manual trades that are required for STP in middle- and back-office systems, including FIS' Stream suite of post trade solutions. This includes Stream Clearvision, Stream GMI, and Stream Ubix trade processing systems.

The success of a trading architecture starts with its ability to collect efficiently all types of incoming business. The Order Flow diagram illustrates the various possibilities available in Valdi:

- The Valdi suite can accept orders from any source in FIX and other protocols via **Valdi FIX**: a high-performance middleware platform for management of multi-protocol connections and message routing
- Orders may be collected from clients via the FIS Global Network, from third-party order routing networks, or via the Internet
- Buy-side trading desks often use the **Valdi EMS** and **Valdi Futures Trader** workstations, which offer order staging, algo trading and pre-trade risk management capabilities
- Used for DMA trading, the Valdi workstations are also used to route care orders to brokers' order management systems
- Valdi's FIX integration ability allows for all incoming FIX traffic from clients to be integrated into a single, coherent FIX session.

Valdi Futures Trading Screen



Valdi Futures Trader

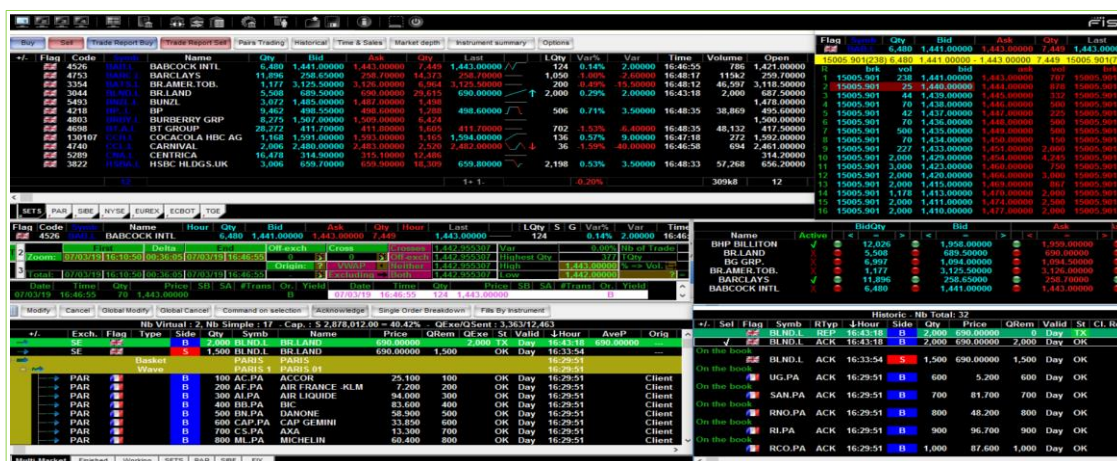
Valdi Futures Trader is a professional trading workstation, designed for trading listed derivatives on the world's global electronic markets. It offers a feature-rich trading experience in a package designed for ease of deployment and is optimized to operate over private networks and the Internet.

Valdi Futures Trader offers:

- Low-latency trading and market data access to 70 derivatives markets around the world, based on FIS' unrivaled range of market gateways

- Client interface tailored to specialists in F&O trading
- Intuitive terminal dedicated to exchange listed futures and options trading
- Execution platform for both internal brokers and external clients
- Global network to access brokers on non-member markets
- Full Order Management Features and FIX capabilities
- Algorithmic Orders types
- Fully hosted by FIS.

Valdi OMS Trading Screen



Valdi OMS Trader

Valdi OMS Trader is our multi-asset front end for agency trading and market-making, offering a high level of automation and designed to handle complex order flows in conjunction with the **Valdi Order**

Management System. Order management, execution and allocation functions for both client and market orders can be handled in real time from a single interface. **Valdi Futures Trader** can also be used by sell-side traders for these purposes.

Advanced execution

The Valdi suite supports trading on all listed asset classes across an unrivalled range of electronic markets: over 170 worldwide.

Trading on electronic derivatives markets gives a range of opportunities to use technology for much more than the sending of orders and receipt of confirmations. Technology software that can handle large order volumes and lot sizes of different types - all at lightning speed, provide a strong platform for effective trading decisions and order execution.

Automated trading

Available as an application on all trading workstations, **Valdi Automate** allows users to build automated trading strategies in MS Excel or other application environments. These strategies may be triggered by market events and movements and may also include a wide range of algorithmic techniques.

Strategies

Valdi Combo Trader enables brokers and proprietary traders to optimize their execution capability by creating tailored multi-instrument trading strategies. The application supports multi-asset trading across multiple markets, for user-defined strategies of up to 32 legs: spread, butterfly, and strip, as well as more complex combinations. Valdi Combo Trader is implemented on a server for sharing by multiple users, which enables high performance, supervision of orders and streamlined upgrade procedures. Users have access to the full range of markets and executed strategies can enter the STP flow directly. Complex strategies can therefore be traded as easily as simple buy/sells.

Program trading

Valdi Program Trader provides a full range of capabilities supporting program trading activities:

- Multi-level basket management
- Waving and scheduling
- In-depth Transaction Cost Research (TCR) functionality.

The basket trading capability is often used to implement index arbitrage strategies, therefore the multi-asset capability of Valdi to support trading across both cash equity and futures markets can be leveraged.

Order management

Order management is a vital and complex activity in every brokerage business: from order capture to allocation, there are many functions involved in a sell-side firm's work on the care order flow received from buy-side clients. A range of optimized and high-performance business processes and trading capabilities are required to ensure high-quality execution. **Valdi OMS** automates the necessary workflows on the basis of flexible rule sets (including multi-site), enabling the efficient processing of large volumes of transactions, on the scale of thousands of orders per second with millisecond latency, and load balancing across multiple market gateways. Based on functionally dedicated technology, the **Valdi OMS** can handle rapid execution of large order flows.

The base OMS package allows traders to carry out all standard order management tasks, such as order capture, slicing, connectivity to connected and non-connected markets. Risk management can be integrated across DMA and order flows, and a dedicated allocation module handles a wide range of allocation modes for client accounts at the trading desk, enabling rapid updates to clearing houses for the appropriate margin adjustments to be made. The OMS can be set up with multiple linked instances to support a single global order book for 24-hour trading teams.

Algorithmic trading

Valdi Tactics and Algo provides a widely deployed, comprehensive library of synthetic order types (iceberg, peg etc.) that can be applied to orders sent from any FIS trading station or interfaced application.

Valdi Algo Trading delivers off-the-shelf trading algorithms, such as TWAP and VWAP, as well as market-specific algorithms. FIS has carried out numerous algo development projects with clients under the remit of our Valdi Algo Services offering, where we develop and tailor algos to meet the client's specific requirements.

Risk management

Business success depends on seeing the right information in the right context to take effective action, and this is especially vital in the control of pre-trade risk. Clearly there must be tight boundaries, but it is equally important that these boundaries are defined in such a way that they do not unduly restrict the activities of trading desks or their clients for DMA, algorithmic trading or care order services.

Multi-asset and multi-currency risk management

FIS has developed a comprehensive pre-trade risk management architecture in **Valdi Selector**, designed to optimize trading firms' ability to manage and make full use of available limits. Valdi Selector allows a particularly fine control of limits on a variety of dimensions and levels – market, department, desk and individual trader or client – and offers full multi-asset and multi-currency capability. The application is also designed to deliver low latency in high-volume trading environments.

Market-specific parameters enable compliance with the regulatory requirements of all supported markets. All information is consolidated in one screen, so that every user – broker, proprietary trader or buy-side client – can assess current overall positions at a glance. Global and detailed position information is available as required.

Similarly, risk limits distributed across different markets can be used in support of one another in an integrated implementation of **Valdi Selector**.

Multiple trading platforms

The traders and DMA (Foreign exchange direct market access) clients at many firms may access a market via multiple different applications: from trading workstations (often from more than one supplier), or directly via Exchange APIs. **Valdi Global Execution Server (GES)** allows a trading supervisor to monitor and control all trading activities across these diverse platforms, with a global view of positions and risk in real time, and to optimize the use of available limits and margin (Exchange drop cop).

Market gateways

FIS has been a consistent leader in enabling trading access to new electronic markets. Today FIS provides high-performance, low-latency trading and market data gateways for over 70 derivatives markets worldwide, and we continue to develop access to emerging electronic markets as a core element of our business strategy. FIS connects to all global derivatives (and equities) Exchanges where there is a community of interest among international market users and their brokers.

Continuously improved and reliable, these high performance, low latency (50 µsec one way), multi-asset gateways are enabled for FIX order routing with standard FIX Rules Of Engagement.

Managed services

FIS offers a complete managed service to brokers for all FIX client on-boarding and order flows.

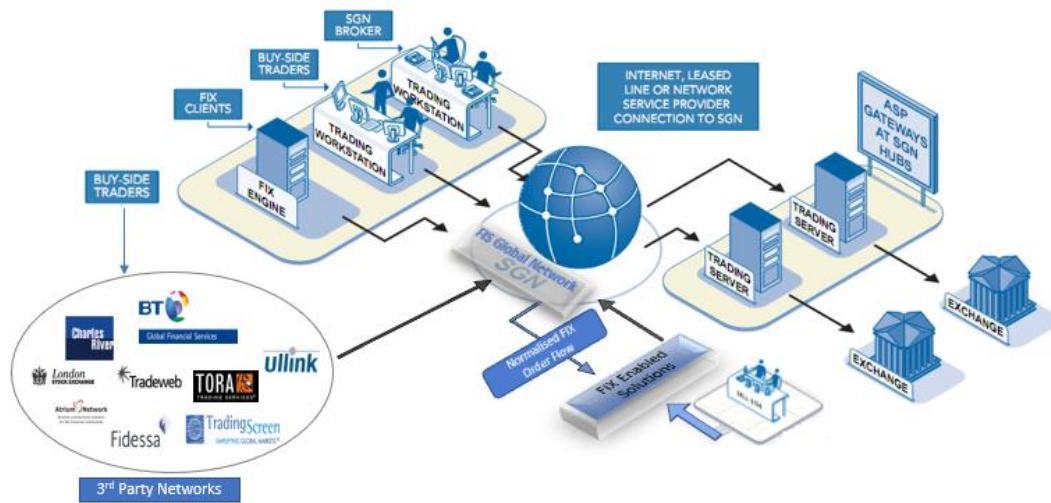
This service covers order collection from the major FIX order routing networks as well as individual client connections.

Flexible installation options and facilities management

FIS can supply all our market gateways for installation at clients' trading premises, or in co-location facilities at Exchanges. FIS also offers Facilities Management services under which we manage gateways, exchange connections and other FIS applications for clients at our secure premises.

ASP Market Access: FIS provides access to over 110 equity and derivatives markets via our fully managed and secure Valdi Market Access offering. This enables exchange members and their DMA clients to trade on all these markets from any workstation or application connected to the FIS Global Network, free of concerns about technical infrastructure and connectivity.

Over 500 market gateways accommodate close to 150 clients on this service, which uses state-of-the-art Linux servers and fast exchange connections to ensure low latency.



FIS's FIX services enable all incoming FIX traffic from clients to be integrated into a single, coherent FIX session.

Orders may be collected from clients via FIS's global network (SGN), from third-party order routing networks, or via the Internet.

CLIENT CONNECTIVITY - MARKET DATA - ORDER MANAGEMENT- ADVANCED EXECUTION



Valdi can handle a variety of data, electronic and manual trades, for STP to middle- and back- office systems, including FIS's Stream suite of post-trade solutions.

Buy-side trading desks often use the Valdi EMS, which offers order staging, algo trading and pre-trade risk management capabilities. Most often used for direct Market access (DMA) trading, the EMS may also be used to route care orders to brokers' order management systems.

The Valdi product suite is an integrated and modular offering that provides:

- Client application and broker connectivity to global equity markets via FIX, FIS's global network (SGN) and the Valdi trading suite
- Advanced execution capabilities at workstation level
- A full-function order management system
- A suite of building blocks, tools and services for algorithmic trading
- Smart routing and associated capabilities for trading in fragmented markets
- Flexible pre-trade risk management, integrable across diverse trading platforms
- High-performance gateways for 150+ markets worldwide.

Advanced reporting, compliance and monitoring

- FIX native **Valdi Panorama** is a powerful order management tool for audit, compliance, supervision, monitoring, technical support and reporting (MiFID, best execution, custom)
- Its intuitive lightweight HTML interface makes light work of managing massive order quantities in real-time and archive modes. Providing vast functionality including global cancel, performance monitoring, alerts, best execution reports and CSV exports with quick easy custom view filters
- **Valdi Panorama** is designed for integration into third party FIX ready systems and collects data from several FIX enabled sources for a consolidated view of real time and historical order flow.

The screenshot shows the Valdi Order Viewer interface. At the top, there's a header with the FIS logo, version 'VALDI 11.1.2.150518 (2015.2.1)', and buttons for 'Order Viewer', 'Export', 'Settings', and a power icon. Below the header, there's a search bar with 'AIR FRANCE' and a 'New View' button. A toolbar contains 'Filters', 'Apply', 'Real Time OFF', 'Load', 'Save', 'Clone', and 'Delete'. The main area is a table with columns: Side, OrderQty, Symbol, SecurityEx..., TimeInForce, Price, OrdStatus, OrderID, AvgPx, CumQty, and Leav... The table contains 14 rows of order data. At the bottom, there are buttons for 'Cancel orders', 'CSV Export', and a status bar showing 'Total Items: 24' and 'Selected Items: 0'.

| Side | OrderQty | Symbol | SecurityEx... | TimeInForce | Price | OrdStatus | OrderID | AvgPx | CumQty | Leav... |
|------|----------|--------------|---------------|-------------|-------|-----------|---------------|-------|--------|---------|
| Sell | 25 | FR0000051732 | XPAR | Day | 50.44 | Filled | 16rzdHhg2T... | 50.44 | 25 | 0 |
| Sell | 22 | FR0000034639 | XPAR | Day | 5.35 | Filled | 16rzdHhg2T... | 5.35 | 22 | 0 |
| Buy | 100 | FR0000034639 | XPAR | Day | 5.35 | Cancelled | 16rzdHhg2T... | 0 | 0 | 0 |
| Buy | 100 | FR0000120073 | XPAR | Day | 92.6 | Cancelled | 16rzdHhg2T... | 92.6 | 47 | 0 |
| Sell | 22 | FR0000071946 | XPAR | Day | 30.62 | Filled | 16rzdHhg2T... | 30.62 | 22 | 0 |
| Sell | 22 | FR0000031122 | XPAR | Day | 7.006 | Filled | 16rzdHhg2T... | 7.006 | 22 | 0 |
| Sell | 25 | FR0000071946 | XPAR | Day | 30.62 | Filled | 16rzdHhg2T... | 30.62 | 25 | 0 |
| Buy | 100 | FR0000031122 | XPAR | Day | 7.006 | Cancelled | 16rzdHhg2T... | 7.006 | 47 | 0 |
| Buy | 100 | FR0000130007 | XPAR | Day | 1.027 | Cancelled | 16rzdHhg2T... | 1.027 | 47 | 0 |
| Sell | 25 | FR0000034639 | XPAR | Day | 5.35 | Filled | 16rzdHhg2T... | 5.35 | 25 | 0 |
| Sell | 25 | FR0000120073 | XPAR | Day | 92.6 | Filled | 16rzdHhg2T... | 92.6 | 25 | 0 |

FIX Integration

FIX integration is made easy with the powerful and versatile **Valdi FIX**. Data enrichment, intuitive plug in library, and scripting tools all provisioned by this robust, fully redundant tool.

With intuitive GUI this vendor agnostic state-of-the-art messaging platform provides management of multi-protocol connections and two-way message routing.

Valdi FIX supports FIX 4.2, 4.2, 5.0 and uses technologies including: • Java • Spring Framework and Enterprise • Application Integration (EAI) • Open frameworks/libraries (Ehcache, Jetty and others) and supports • JMS / ActiveMQ • JDBC • Flat file.

Valdi FIX natively supports Valdi binary protocol for direct connection to Valdi Trading Servers, Order Management System, and Market Data Servers facilitating integration within multi-vendor environments.

This wide range of connectivity options, combined with the Java Enterprise Integration framework, enables comprehensive FIX order flow management and incorporates flexible routing, enrichment and filtering capabilities.

Get greater flexibility, connectivity and real-time speed with FIS.

Get connected: email getinfo@fisglobal.com

For further information visit our Front Office and Trading [microsite](#)

About FIS

FIS is a global leader in financial services technology, with a focus on retail and institutional banking, payments, asset and wealth management, risk and compliance, consulting and outsourcing solutions. Through the depth and breadth of our solutions portfolio, global capabilities and domain expertise, FIS serves more than 20,000 clients in over 130 countries. Headquartered in Jacksonville, Florida, FIS employs more than 47,000 people worldwide and holds leadership positions in payment processing, financial software and banking solutions. Providing software, services and outsourcing of the technology that empowers the financial world, FIS is a Fortune 500 company and is a member of Standard & Poor's 500® Index. For more information about FIS, visit www.fisglobal.com.



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