

EQUIDUCT

Market Viewer User Guide

Document Version: 2.5

Date: July 2010

Contact: marketviewer@equiduct.com

Table of Contents

Contents

Introduction to the Equiduct Market Viewer.....	3
Scope of Service.....	3
Access to the Market Viewer	3
General information.....	6
Selecting an Instrument.....	6
Colour-coded venues.....	6
Including / Excluding Exchange Fees	7
Live View.....	8
Order Book.....	8
Interpreting the Book View	8
Customising the Order Book View.....	8
Chart View	9
Interpreting the Chart View.....	9
Chart View Controls.....	10
Replay View	11
Selecting a Time Point	11
Including / Excluding Market Venues	11
Order Book.....	12
Interpreting Order Book Results.....	12
Customising the Order Book View.....	13
Chart View	14
Interpreting the Chart View.....	14
Chart View Controls.....	15

Introduction to the Equiduct Market Viewer

The Market Viewer presents a graphical view of market liquidity and trading conditions either in real-time or at a specified point in the past.

Scope of Service

Equiduct Market Viewer provides coverage of all securities which meet the following selection criteria:

- Listed on the CESR Database of MiFID Instruments, AND
- Continuously traded on at least two trading venues , AND
- Eligible for CCP clearing in either SIS X-Clear, LCH.Clearnet Ltd. or LCH.Clearnet SA, AND
- A constituent of FTSE100, FTSE250, FTSE350, AEX, BEL20, CAC40, DAX30, PSI, Euronext100, Euronext150, Stoxx50, DJStoxx50, OR
- Have a Liquidity Fragmentation Index (LFI) with a value greater than 1, OR
- Traded with sufficient liquidity as determined by Equiduct.

At present, this security universe contains over 1100 stocks and is reviewed monthly. Where a security is traded on different venues in different currencies, then these stock/currency combinations are considered separate instruments. For example, 'Royal Dutch Shell' is traded on BATS, Chi-X, LSE, and Turquoise in Sterling, but is traded in Euros on BATS, Chi-X, Xetra, Euronext Amsterdam, and Turquoise. The Market Viewer considers the Sterling and Euro venues separately for calculating a consolidated market view.

Full order book depth (Level II) and time and sales data are captured from seven venues;

- BATS Trading Europe
- Chi-X
- Deutsche Börse (Xetra)
- Euronext (Paris, Amsterdam, Brussels, Lisbon)
- London Stock Exchange
- Turquoise Visible
- Equiduct HybridBook

Equiduct may extend this list to include new markets.

Market Viewer Availability

- Live data is available from: 08:00-16:35 GMT.
- Historical data is available 24/7¹.

Access to the Market Viewer

You can access the Market Viewer:

¹ The Historical Data is currently not available between 05:55 & 06:40 GMT and between 17:15 & 17:45 GMT.

- By clicking on the stock of your choice on the instrument list available on Equiduct website: <http://www.equiduct-trading.com/trading-venue/instruments-traded.asp>

	A	B	C	D
1	Consolidated liquidity fragmentation Real-time	ISIN	Instrument Name	Currency
2				
680	RB_GBX	GB00B24CGK77	RECKITT BENCKISER GROUP PLC	GBX
681	SBSGBX	GB0007547838	ROYAL BANK OF SCOTLAND GROUP PLC	GBX
682	RCPGBX	GB0007366395	RIT CAPITAL PARTNERS	GBX
683	RDSAGBX	GB00B03MLX29	ROYAL DUTCH SHELL A	GBX
684	RDSBGBX	GB00B03MM408	ROYAL DUTCH SHELL B	GBX

Figure 1: Select an Instrument in the instrument list

- Directly from Equiduct website, by clicking on “Real Time Data” on the homepage or on the left menu, or accessing <https://marketviewer.equiduct.com/> directly. Once on the MarketViewer webpage, an entry box will be displayed. Type a security name in the text field and a list of instruments that contains the letters will be populated in the drop down list, allowing you to select the instrument you wish to see. There is no need to log-in.

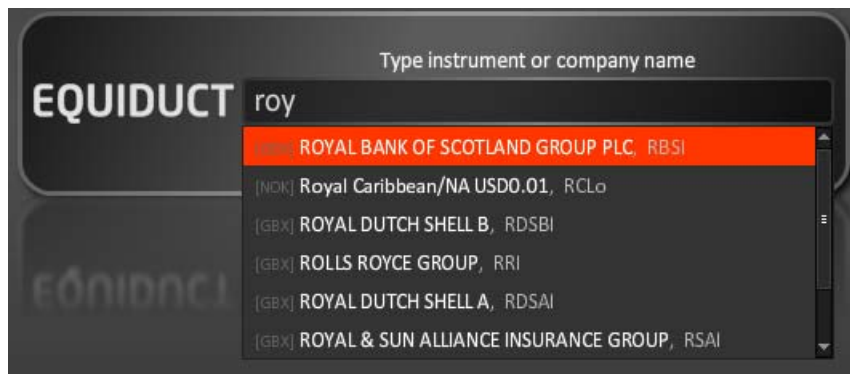


Figure 2: Type the security name and select an Instrument in the entry box

The main Market Viewer display will then appear:

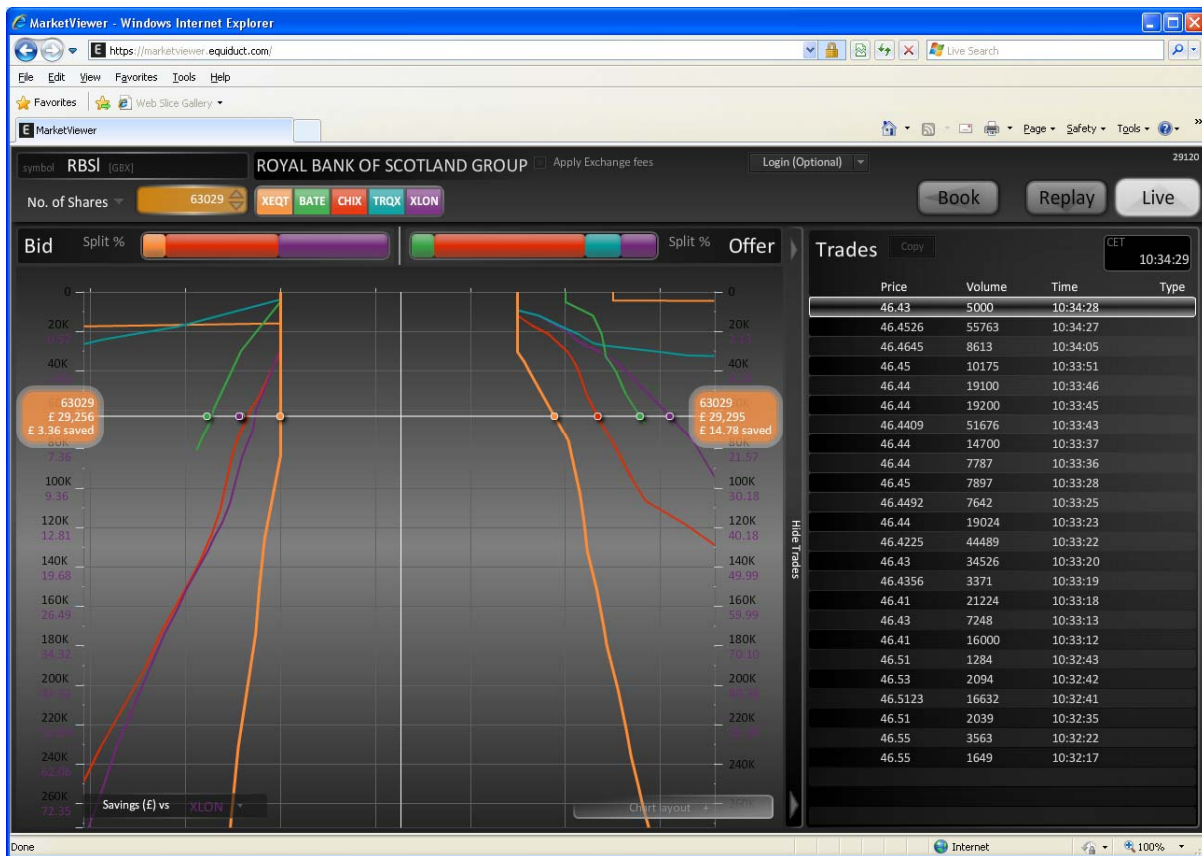


Figure 3: Market Viewer Live mode – chart view

General information

The Market Viewer has two basic modes – Live and Replay - each including 2 basic views: the chart view and the order book view.

- Live: Shows current pan-European liquidity for the selected instrument
- Replay: Shows pan-European liquidity as of a given point-in-time in the past, selected on the basis of a reported trade in the chosen instrument

From any mode and any view, you can select an instrument and include or exclude exchange fees.

Selecting an Instrument

To view an instrument, click in the stock selection box (found in the top left hand corner of the viewer), and begin typing the security name. The box features a ‘type-ahead’ function, suggesting matching securities given your input text. Click on the appropriate instrument with your mouse, and the current view (order book or chart) will retrieve the data for the relevant security.

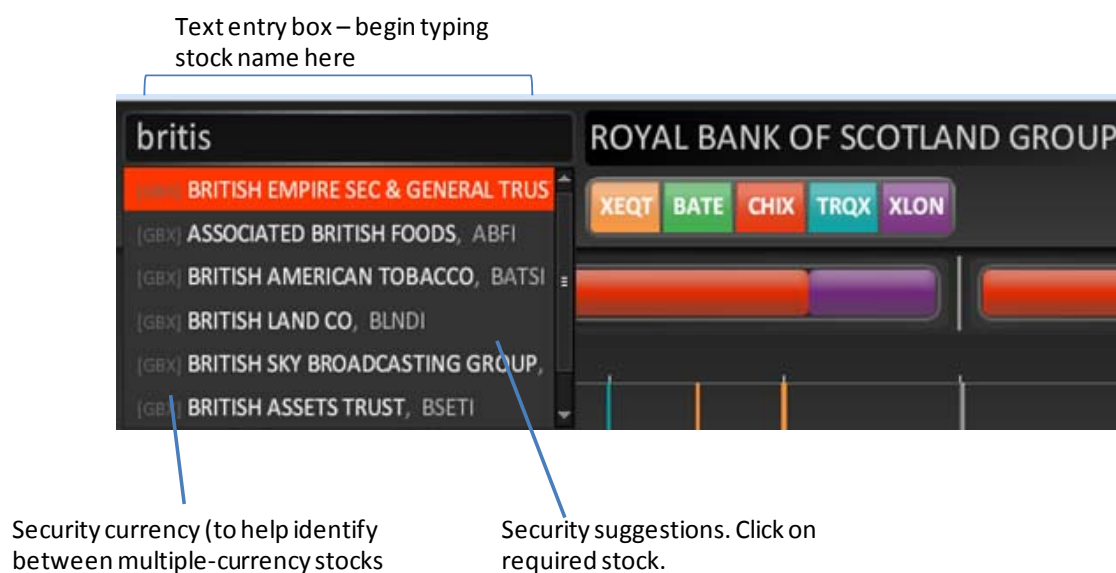


Figure 4: Select an Instrument in the Security Selection Box

Colour-coded venues

The short names for trading venues used throughout the Market Viewer are MIC codes (Market Identification Codes – an ISO standard). For convenience the current venue list is shown below:

MIC Code	Venue	Colouring
XEQT	Equiduct Trading	Orange
BATE	BATS Trading Europe	Green
CHIX	Chi-X	Red
TRQX	Turquoise	Turquoise
XAMS	Euronext Amsterdam	Yellow
XBRU	Euronext Brussels	Yellow
XETR	Deutsche Börse (Xetra)	Brown
XLIS	Euronext Lisbon	Yellow
XLON	London Stock Exchange	Purple
XPAR	Euronext Paris	Yellow

All Euronext markets are shown in the same colour, as they form part of the same Exchange group, and the market is organised in such a way that a single security may only trade on one Euronext market at any point in time.

Including / Excluding Exchange Fees

The Market Viewer also has the ability to allow users to choose whether to adjust order book prices to incorporate the associated fee of each market venue present in the order book. This is done by either checking or unchecking the check box that resides above the market venue legend:

Exchange Fees Check Box

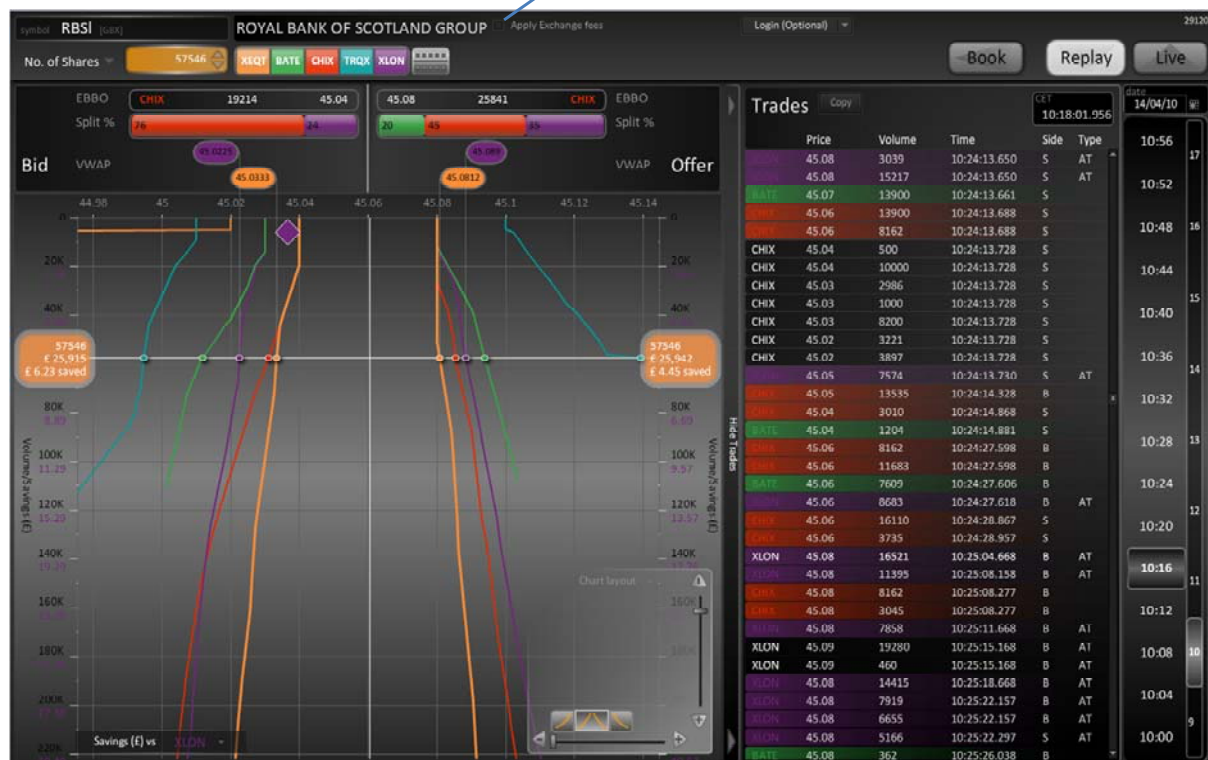


Figure 5: Click on the Exchange Fees Check Box to include/exclude the exchange fees from the analysis

Checking the box will reorder the underlying order book according to the fee adjusted prices. The fee adjusted price is the original price altered in most cases by the aggressive charge published by the market venue. A list of fees used in the calculation can be found in the Equiduct LFA Product Information published on the website – in the Downloads section : <http://www.equiduct-trading.com/home/downloads.asp>

Live View

The Live mode has two basic views: the order book view and the chart view. This first section explains the order book view.

Order Book

Once you are on the Live view, click on the Book button displayed on the top right hand corner of the screen to view the live order book.

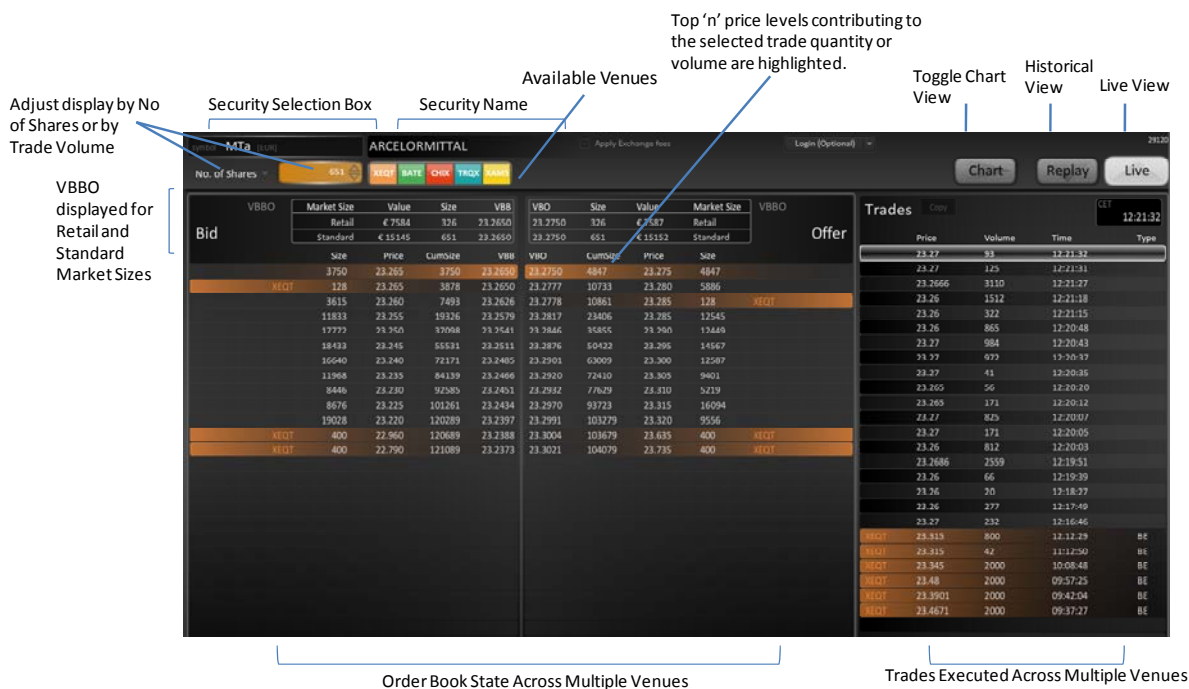


Figure 6: Order Book – Live Mode

Interpreting the Book View

The order book is updated in real-time. It shows how liquidity is fragmented between venues and how it moves quickly between the venues.

The main panel of the order book view shows the pan-European order book for the security, consolidated by price level, and the right panel displays a per-second summary of the trades executed in the chosen security.

Market Size	Value	Size	VBB	VBO	Size	Value	Market Size
Retail	€ 7314	205	35.6800	35.6950	205	€ 7317	Retail
Standard	€ 14628	410	35.6800	35.6963	410	€ 14635	Standard

Fig 7: Zoom on the VBB0 displayed

Customising the Order Book View

It is possible to re-order the columns in the Consolidated Order Book by dragging the titles to the left or right.

Chart View

The second view available in the Market Viewer is the chart view.

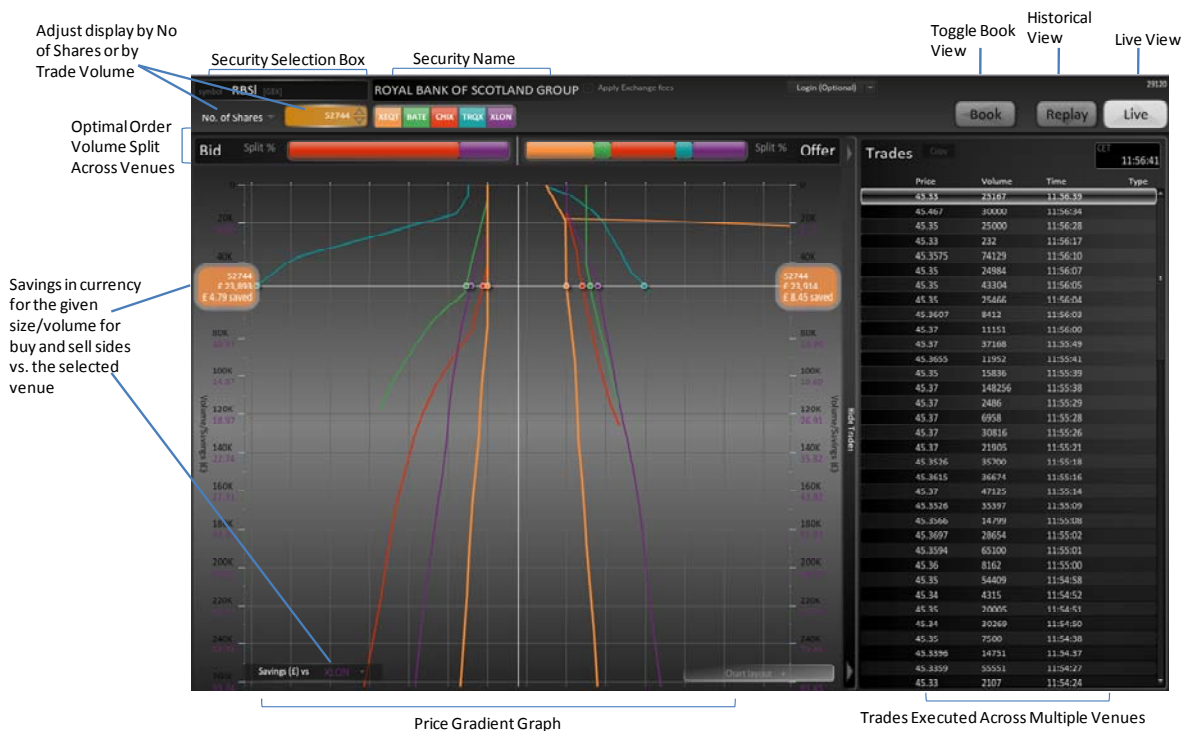


Figure 8: Chart view – Live Mode

The Chart View contains many of the same work areas as the Order Book View described previously. Notably, the Security Selection Box. In addition, the Volume Viewer box allows you to view the optimal order split required in order to achieve the best price for the theoretical order across all the venues at that instant.

It is possible to toggle between the Order Book and Chart views using the button in the top-right corner of the screen.

As for the Order Book view, the right panel displays a per-second summary of the trades executed in the chosen security.

Interpreting the Chart View

The central price gradient graph shows a graphical depiction of order book depth on individual venues (colour-coded by venue), with VBBO – Volume-weighted Best Bid and Offer (shown in orange).

- The horizontal axis on the chart represents the market price, while the vertical axis shows cumulative volume available on the order book of the relevant venue.

- Lines to the left of the central line represent the bid side of the order books, while lines to the right of centre represent the offer side of the order books.
- The price where a line hits the horizontal axis indicates the best bid/offer price of the relevant venue.

The lines on the chart show the depth of the order book of the relevant venue. A steep line indicates that the order book has a lot of volume within a small price increment (high liquidity), whereas a shallow line indicates that there is little volume within the top price levels (low liquidity).

The VBBO line (shown in orange), shows the best possible prices available under an optimal order split strategy indicated by the order split bar at the top of the graph – this is the price available in Equiduct’s PartnerEx trading segment.

Chart View Controls

The Chart View is interactive in nature, allowing the user to easily change the parameters used in various calculations and the display of the charts. These are indicated below;



Figure9: Chart View Controls

Replay View

Selecting a Time Point

The Market Viewer – Replay mode is designed to show the market position at the time of a particular trade. A time point is selected by choosing a date, clicking on an hour to view, followed by a time interval (to the nearest 4 minutes). These three actions will populate the time and sales with trades around the indicated time. You are then able to scroll through the trades, and click on a given trade to view the market position at that point in time.

Historical queries only allow data more than 15 minutes old to be displayed.

Trades Copy

CET 10:17:04.301

date 01/04/10

Date Search

	Price	Volume	Time	Side	Type
TFCX	363.95	3849	10:26:56.372	S	5
BATE	363.85	451	10:26:56.382	S	
BATE	363.85	398	10:26:56.451	S	
CHIX	363.85	1742	10:26:56.513	S	
CHIX	363.80	1945	10:26:56.523	S	
	363.85	655	10:26:56.528	S	AT
	363.85	413	10:26:56.548	S	AT
BATE	363.70	518	10:27:03.281	S	
CHIX	363.75	109	10:27:03.283	S	
CHIX	363.70	1167	10:27:03.293	S	
XLON	363.75	80	10:27:05.038	S	AT
XLON	363.985	460	10:27:05.549	?	O
CHIX	363.80	2000	10:27:06.624	B	
CHIX	363.80	1583	10:27:06.624	B	
CHIX	363.80	587	10:27:06.634	B	
CHIX	363.80	587	10:27:16.124	S	
CHIX	363.85	3250	10:27:16.394	B	
BATE	363.75	100	10:27:30.712	S	
CHIX	363.80	38	10:27:30.724	S	
CHIX	363.80	2000	10:27:30.724	S	
CHIX	363.80	117	10:27:40.489	S	
CHIX	363.80	2000	10:27:40.489	S	
CHIX	363.75	2000	10:27:40.489	S	
CHIX	363.75	400	10:27:40.489	S	
XLON	363.75	889	10:27:53.002	S	AT
BATE	363.75	456	10:27:55.139	S	
BATE	363.75	1635	10:27:55.140	S	
BATE	363.75	1033	10:27:55.140	S	
BATE	363.75	26	10:27:55.140	S	
CHIX	363.80	94	10:27:55.141	S	
XLON	363.75	253	10:27:55.143	S	AT
XLON	363.75	748	10:27:55.143	S	AT
XLON	363.75	3562	10:27:55.143	S	AT
XLON	363.75	289	10:27:55.143	S	AT

1. Select search hour
2. Select search minute
3. Select trade

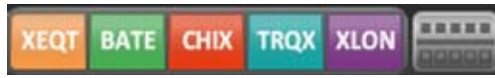
Figure10: Selecting a time point

Including / Excluding Market Venues

By default, the Market Viewer will show data from all venues trading the selected instrument (in the currency indicated). A colour-coded legend appears at the top of the Market Viewer to indicate which venues are included, and how they are coloured in the rest of the window.

It is possible, however, to include or exclude certain venues from the view by clicking on a coloured box to grey it out. There is a two-way button at the right-hand side of the legend which allows you to include or exclude all available venues.

Colour-coded legend venues shown in order book/time and sale (trade) panels



Click top half of button to enable all venues
Click bottom half to disable all venues

Click on a coloured venue to exclude it from the analysis.

Figure 11: Including/Excluding Market Venues

Order Book

Interpreting Order Book Results

Once you have selected an instrument, time point, and markets to be viewed, the main panel of the order book view shows the consolidated European order book for the security to the millisecond before the corresponding order is filled. The resulting Consolidated Book view shows the snapshot of all reference markets at the start of the millisecond in which the trade occurred.²

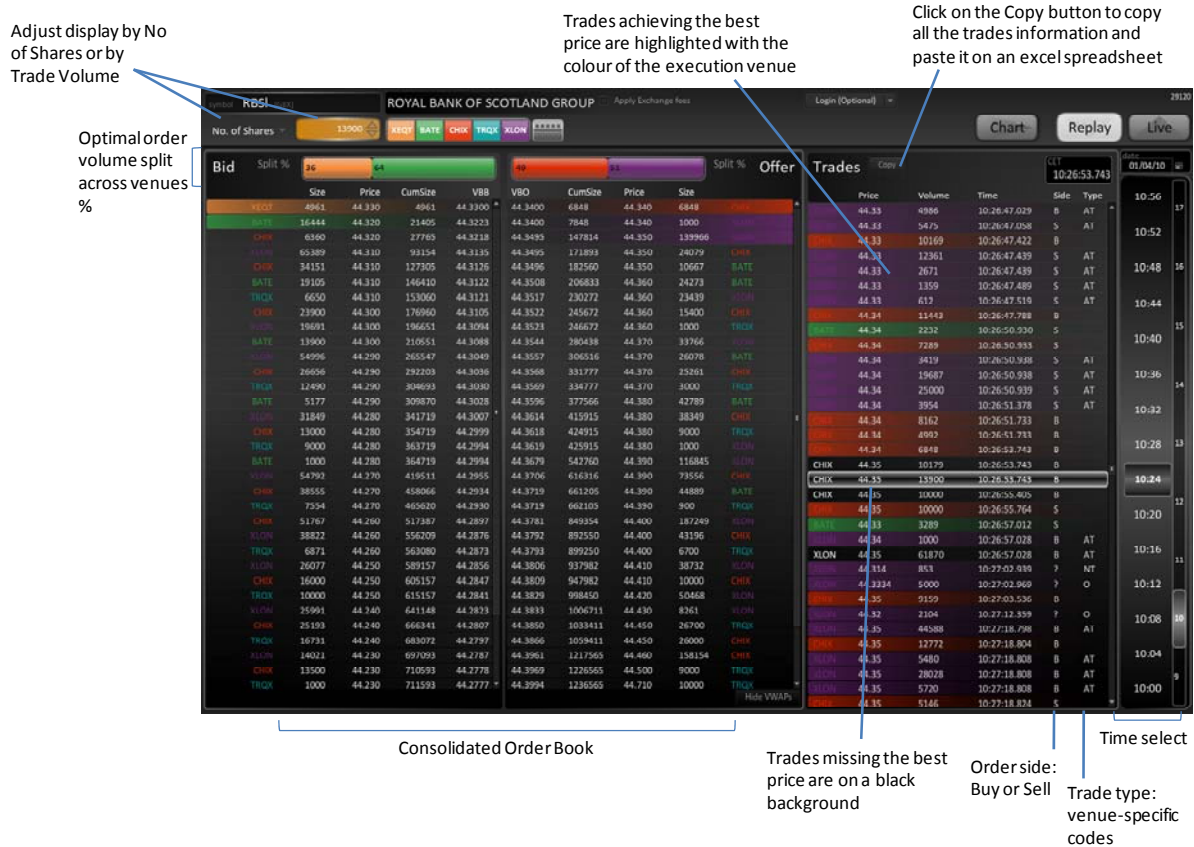


Figure 12: Order Book – Replay Mode

The Volume Viewer box allows you to view the optimal order split across selected venues at that instant. By default, the volume of the trade selected to identify the time point is entered into the

² In some cases -such as multiple executions in the same millisecond- the Consolidated Book could be out of step with the selected trade

Volume Viewer box, to help analysis. It is possible, however, to run the analysis on an alternate volume simply by typing a quantity in the entry box.

Towards the top of the consolidated order book, a set of rows will be highlighted. These represent the price levels on various exchanges that must be executed to fill a theoretical order of a size equal to the Volume Viewer value. Using the above figure as an example, the highlighted rows show the number of price levels and venues that a theoretical order to buy or sell 13,900 shares (the Volume Viewer number) must execute in order to fully execute.

Just above the consolidated order book, there is a coloured bar, which shows the optimal order volume split required in order to achieve the best price for the theoretical order. Using the example in the figure, the Market Viewer suggests that the buy order for 13,900 shares should have been split according to the following allocation to achieve the best price;

- 36% to Equiduct HybridBook (orange)
- 64% to BATS (green)

(Note that these percentage splits are rounded to remove decimal places, which can cause the percentage total to sometimes equals 99% or 101%).

On the right panel, the trades not highlighted (ie with a black background) are those which were executed at a price worse than the EBBO at the time of the trade.

The copy button on the top left of the Trades panel allows you to copy all the trades information (venue, price, volume, time, order side) for a given hour and paste it on an excel spreadsheet for offline analysis.

Customising the Order Book View

It is possible to re-order the columns in the Consolidated Order Book by dragging the titles to the left or right.

Chart View

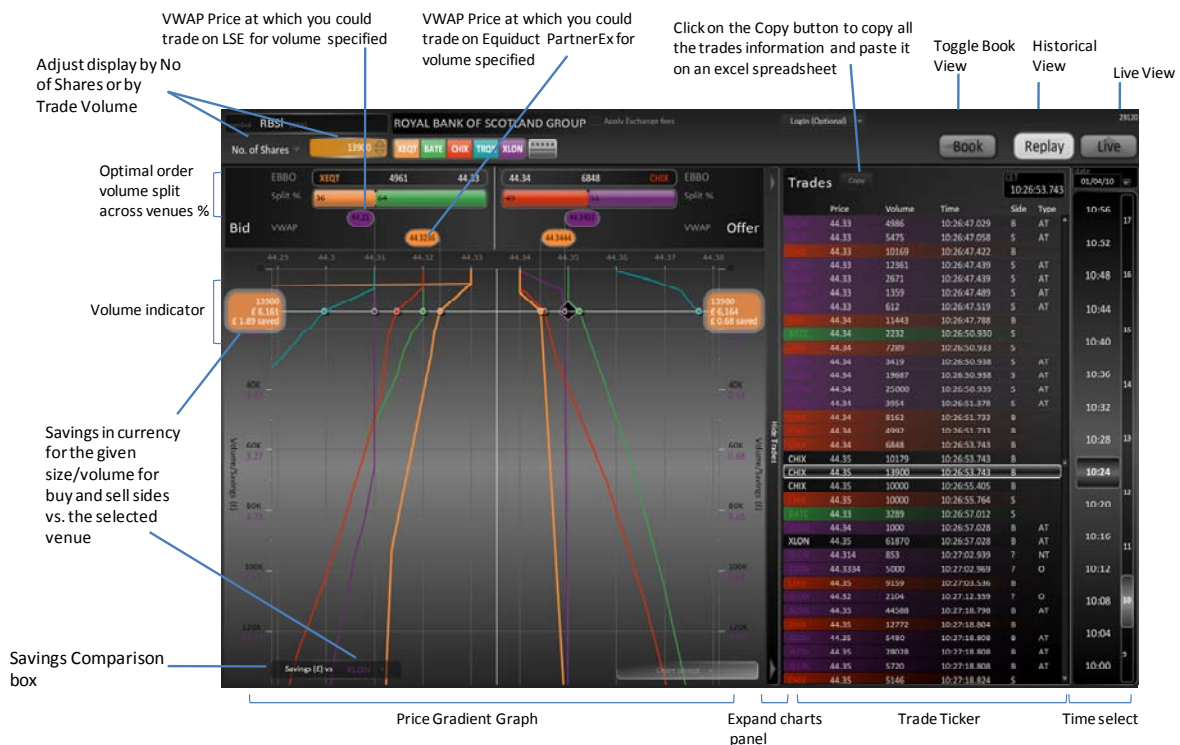


Figure 13: Chart View – Replay Mode

The Chart View contains many of the same work areas as the Order Book View described previously. Notably, the Security Selection Box, the including/excluding market venues system and the mechanism for identifying a time point is identical and therefore not repeated here. Also similar to the Live mode, it is possible to toggle between the Order Book and Chart views using the button in the top-right corner of the screen.

Interpreting the Chart View

The central price gradient graph shows a graphical depiction of order book depth on individual venues (colour-coded by venues), with the consolidated order book depth (shown in orange).

- The horizontal axis on the chart represents the market price, while the vertical axis shows cumulative volume available on the order book of the relevant venue.
- Lines to the left of the central line represent the bid side of the order books, while lines to the right of centre represent the offer side of the order books.
- The price where a line hits the horizontal axis indicates the best bid/offer price of the relevant venue.
- Dots on the chart represent the price you would have achieved on each markets for the selected volume.

The lines on the chart show the depth of the order book of the relevant venue. A steep line indicates that the order book has a lot of volume within a small price increment (high liquidity), whereas a shallow line indicates that there is little volume within the top price levels (low liquidity).

The VBBO line (shown in orange), shows the best possible prices available under an optimal order split strategy indicated by the order split bar at the top of the graph – this is the price available in Equiduct’s PartnerEx trading segment.

On the bottom left, the Savings Comparison box allows you to display in the third line of the Volume Indicator the savings (in bps) when compared to a chosen venue. When you select a trade, by default, the savings displayed are the result from the comparison between the executed price on the home market and the best possible price.

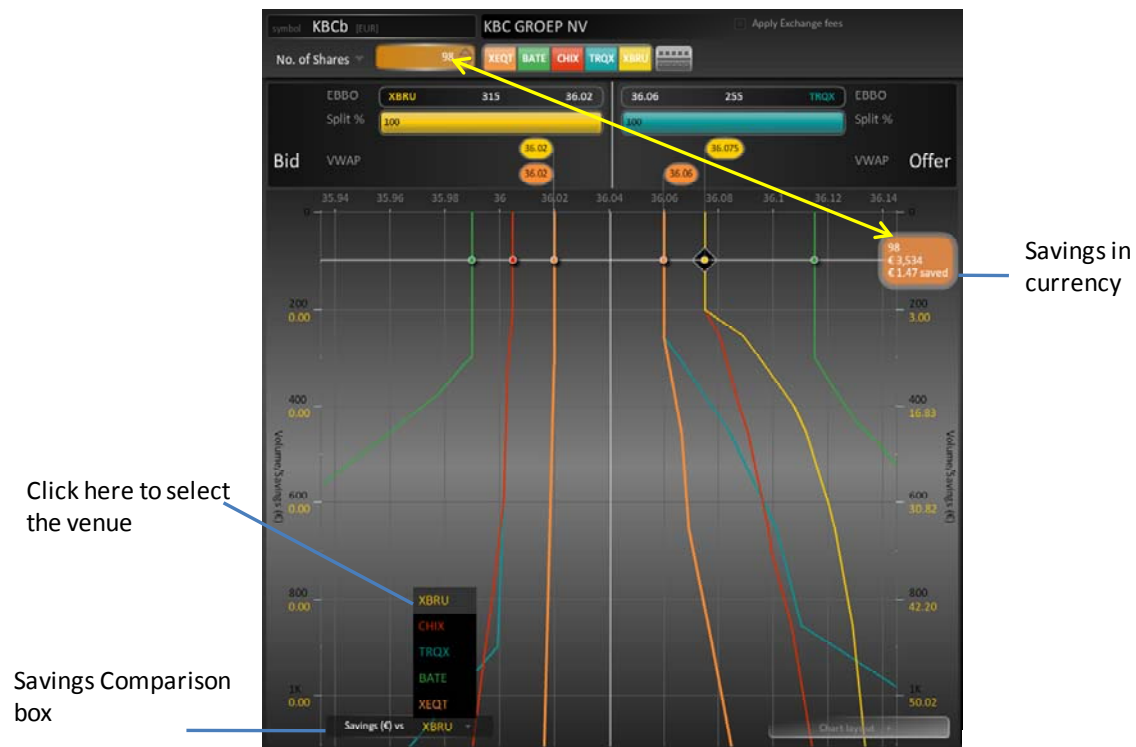


Figure 14: Savings Comparison

In the example, the savings vs. the home market amounts to 3.77€ for the given quantity: 470 shares.

Chart View Controls

The options to change the chart display are the same as for the Live mode.

Technical requirement

The Market Viewer is delivered over a secure internet connection. System requirements are Flash Player v9 or above with Javascript enabled. The version of the Flash Player installed can be verified by using <http://www.macromedia.com/software/flash/about/>

Equiduct Systems

70 St Mary Axe, London EC3A 8BE, UK

+44 (0)20 3102 4080

www.equiduct.com