
Release Notes

08 May 2019



London
Stock Exchange

London Stock Exchange Derivatives Market

SOLA Trading System - Version 13

Release Notes

8 May 2019

Version 1.0



London
Stock Exchange Group

1.0 Document history

This document has been through the following iterations:

Version	Date	Section	Description
1.0	May 2019		First issue of this document published via LSEG's website and distributed to LSEDM customers.

2.0 Purpose

This document provides LSEDM customers with a high-level functional description of the changes introduced in Version 13 of the SOLA® Trading System, as well as guidelines for the impacts on the trading system's protocols connected to these business enhancements. A full description of the changes to SOLA's protocols is described in the protocol specifications indicated at paragraph 4 (SAIL, FIX 4.2 and HSVF protocol specification documents). A summary of the changes is reported in paragraphs 7, 8 and 9. In case of any discrepancy between this document and the SAIL, FIX and HSVF protocol specifications, protocol specifications shall prevail.

3.0 Readership

This document is particularly relevant to technology teams within LSEDM's member firms, as it describes the changes to the technical interfaces in use to connect to the LSEDM market.

4.0 Document series

This document is part of a series of documents which provide technical specifications for the SOLA® Trading System. This series of documents includes:

- LSEDM - Trading Services Description - Issue 7.8
- SOLA Connectivity Guide - Issue 4.4
- SAIL Protocol: SAIL Specification - Issue 7.0
- FIX Protocol: FIX 4.2 Specification - Issue 7.0
- HSVF Market Data - Issue 10.0
- LSEDM - Guide To Pre-Trade Validation Service - Issue 3.0

The latest version of these documents can be found in the [LSEDM Document Library](#).

5.0 Enquiries

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6.0 New functionalities supported in Version 13 of the SOLA[®] Trading System

Version 13 of the SOLA[®] Trading System will support the following main functional enhancements:

- enhancements to implied-out functionality (off-tick prices);
- enhancements to dissemination of reference and settlement prices.

A description of the key features of these enhancements, reason for change and relevant protocol changes are described in the following paragraphs.

6.1 Enhancements to implied-out functionality (off-tick prices)

Version 13 of the SOLA[®] Trading System will support the possibility to offer a finer price granularity for strategy instruments, in comparison to their outright legs. This change will allow market participants to improve the price formation process in CurveGlobal[®] strategies, in particular for spreads strategies where the net price of the strategy - the difference between the prices of the composing legs - is naturally lower than outright instruments.

Following the introduction of a reduced tick size for strategy instruments, implied-out orders generated on the legs' order books can be prices that are not aligned with the tick table in place for the outright legs ("off-tick"). These orders will be executed, as it is today, preserving price-time priority across the order book. The existence of such off-tick implied orders will be signaled to the market through a new implied price level (levels "B") in "Market Depth" messages of the HSVF protocol.

Level "B" (on the buy and/or sell side of the order book) will be populated only in case of existence of any (at least one) off-tick implied out order. Otherwise, as it is today, the current level "A" will be populated with price and quantity of the existing implied-out order(s). As a consequence, "A" and "B" levels are never disseminated at the same time, for the same side of an outright instrument.

Prices in the implied "B" level will be still rounded to the outright's tick table (upwards for implied orders to buy, downwards for implied orders to sell), An aggressive order will always be matched at a price that is equal to or better than the one disseminated in the "B" implied price level.

Please refer to the example below for additional details.

Example:

The Short Sterling future and SONIA futures contracts have a minimum tick increment of 0.005; the minimum tick increment for their Inter Commodity Spread (ICS) is 0.001 instead.

Order Books

ICS (+1 SONIA Future, -1 Short Sterling future)

BidQty	BidPrice	AskPrice	AskQty
		0.094	10

Short Sterling Future

BidQty	BidPrice	AskPrice	AskQty
		99.340	200

SONIA Future

BidQty	BidPrice	AskPrice	AskQty
		99.434*	10

* Implied Order

Market Data (HSVF)

ICS (+1 SONIA Future, -1 Short Sterling future)

Level	BidQty	BidPrice	AskPrice	AskQty
1			0.094	10

Short Sterling Future

Level	BidQty	BidPrice	AskPrice	AskQty
1			99.340	200

SONIA Future

Level	BidQty	BidPrice	AskPrice	AskQty
B			99.435	10

The implied price disseminated in market data for the SONIA future is rounded to the first price that is compatible with the tick table of the contract (from 99.434 to 99.435, in yellow).

When a new order to buy 10 lots at 99.435 of the SONIA Future is inserted, the following trades for the outright are generated:

- 10 lots of Short Sterling future at 99.340;
- 10 lots of SONIA future at **99.434** (so, at the real implied out price recorded in the SONIA future order book, that is valid to the purposes of the matching process).

The effective execution buy price of 99.434 is better than the 99.435 price shown in market data implied level "B".

Please note that the quantity disseminated in the "B" implied level is the sum of the quantities of all implied orders (buy or sell) whose effective implied prices are between:

- the disseminated price level (included);
- the next price level that is compatible with the outright tick table (excluded)¹.

¹ By price priority. So, the next lower price for implied orders to buy (bid side of the order book), and the next higher price for implied orders to sell (ask side).

Example:

The same minimum tick increments of the previous example apply. The status of the order books for the Short Sterling Future and SONIA Future are the following:

Order Books				Market Data (HSVF)				
Short Sterling Future				Short Sterling Future				
BidQty	BidPrice	AskPrice	AskQty	L	BidQty	BidPrice	AskPrice	AskQty
		99.340	200	1			99.340	200
SONIA Future				SONIA Future				
BidQty	BidPrice	AskPrice	AskQty	L	BidQty	BidPrice	AskPrice	AskQty
		99.435	50	1			99.435	50

The following 3 orders are inserted on the ICS between the two contracts:

Order Books				Market Data (HSVF)				
ICS (+1 SONIA Future, -1 Short Sterling future)				ICS (+1 SONIA Future, -1 Short Sterling future)				
BidQty	BidPrice	AskPrice	AskQty	L	BidQty	BidPrice	AskPrice	AskQty
		0.093	10	1			0.093	10
		0.094	10	2			0.094	10
		0.095	100	3			0.095	100

As a consequence, three implied orders are generated on the Short Sterling Futures:

Order Books				Market Data (HSVF)				
Short Sterling Future				Short Sterling Future				
BidQty	BidPrice	AskPrice	AskQty	L	BidQty	BidPrice	AskPrice	AskQty
		99.340	200 (P)	1			99.340	200
		99.340*	100 (Q)	A			99.340	100
		99.341*	10 (R)					
		99.342*	10 (S)					

* Implied Orders

The price of the implied orders “Q” is compatible with the tick table for the outright leg. The price of the other implied orders (“R” and “S”), once rounded to the tick table for the outright leg, would instead be equal to 99.345. For this reason, implied “A” level is disseminated (with quantity = 100), while implied “B” level is not.

Three implied orders are also generated on the SONIA Futures.

Order Books				Market Data (HSVF)				
SONIA Future				SONIA Future				
BidQty	BidPrice	AskPrice	AskQty	L	BidQty	BidPrice	AskPrice	AskQty
		99.433*	10 (V)	1			99.435	50
		99.434*	10 (W)	B			99.435	120
		99.435	50 (X)					
		99.435*	100 (Y)					

* Implied Orders

The implied “B” level for the SONIA Future is disseminating the total quantity of all implied-out orders since all (rounded) prices are at the same price of 99.435 (orders “V”, “W” and “Y”, in yellow).

When a new order to buy 150 lots at 99.435 of the SONIA Future is inserted, the following trades for the outrights are generated:

- 150 lots of Short Sterling future at 99.340;
- 10 lots of SONIA future at 99.433 (implied order “V”);
- 10 lots of SONIA future at 99.434 (implied order “W”);
- 50 lots of SONIA future at 99.435 (order “X”²)
- 80 lots of SONIA future at 99.435 (implied order “Y”)

The volume weighted execution price for the aggressive buy order will be equal to **99.4348** ($=\frac{10 \times 99.433 + 10 \times 99.434 + 130 \times 99.435}{150}$), that is better than the 99.435 price shown in market data implied level “B”.

6.2 Enhancements to dissemination of reference and settlement prices

Version 13 of the SOLA® Trading System will enrich the information distributed in the market data “Option Summary” and “Futures Summary” messages, in order to help customers in interpreting the content of the Summary Message. The event that triggered the dissemination of the Summary Message will now be indicated, among the following:

- “Start of Day”, when Summary Messages containing reference data for all tradable series are disseminated;
- an update in the value of the Open Interest (including dissemination of Open Interest at the end of the trading day), when Summary Messages containing a new open interest are disseminated for all tradable series;
- calculation of the Daily Settlement Price (DSP), when Summary Messages containing the DSP are disseminated for all tradable series;
- for Long Gilt futures and during the notice period only, the calculation of the Final Settlement Price (EDSP), when Summary Messages containing the EDSP are disseminated;
- the cancellation of a trade, when a Summary Message containing updated trading statistics is disseminated for the instrument involved in the trade cancellation.

The table below summarizes the content of the relevant Summary Message fields, according to the event that triggered its dissemination.

Field(s)	“Settlement Price”	“Open Interest”	Trading Statistics (Last/High/Low Price, Volume, Net Change Sign, Net Change)
<i>Event</i>			

² At the same execution price, non-implied orders always have priority over implied orders.

<i>Start of Day (Reference Data)</i>	<empty>	Latest Open Interest already disseminated	As per the latest disseminated trade message
<i>Open Interest Update</i>	<empty>	Updated Open Interest	As per the latest disseminated trade message
<i>Settlement Price (DSP)</i>	DSP	Latest Open Interest already disseminated	As per the latest disseminated trade message
<i>Final Settlement Price (EDSP)</i>	EDSP	Latest Open Interest already disseminated	As per the latest disseminated trade message
<i>Trade Cancellation</i>	<empty> / Settlement Price / Final Settlement Price (last price already disseminated, depending on the time of the day when the cancellation occurred)	Latest Open Interest already disseminated	Trading Statistics are updated to reflect the trade cancellation

7.0 Interface changes: SAIL protocol

No changes to the native SOLA® Access Information Language (SAIL) protocol are introduced with the functional enhancements described in this Release Notes.

8.0 Interface changes: FIX 4.2 protocol

No changes to the FIX protocol in use by the SOLA® Trading System are introduced with the functional enhancements described in this Release Notes.

9.0 Interface changes: HSVF protocol

The following table provides a full description of the changes to the market data (HSVF) protocol, introduced by the functional enhancements described in this Release Notes.

Field	Messages	Description of the change	Linked to
Level of Market Depth	H (Options Market Depth) HF (Future Market Depth) HS (Strategy Market Depth)	New value to indicate a new implied level: - "1" (existing value): Level 1 book price and aggregated quantity; - "2" (existing value): Level 2 book price and aggregated quantity; - "3" (existing value): Level 3 book price and aggregated quantity; - "4" (existing value): Level 4 book price and aggregated quantity; - "5" (existing value): Level 5 book price and aggregated quantity; - "A" (existing value): Implied price – The whole implied quantity disseminated is available for execution at the reported "at-tick" price;	Enhancements to implied-out functionality (off-tick prices) (6.1)

		<ul style="list-style-type: none"> - "B" (new value): Implied off-tick price – At least 1 lot of the disseminated quantity is available at an improved "off-tick" price. 	
Event Type	N (Options Summary Message) NF (Future Summary Message)	<p>Formerly a filler field, it will be now valued to describe the event type that triggered the dissemination of the Summary message, specifically:</p> <ul style="list-style-type: none"> - "C" (new value): "Trade cancellation" – The dissemination of the Summary message was triggered by the cancellation of a trade; - "D" (new value): "Daily Settlement Price" – The dissemination of the Summary message was triggered by the calculation of the Daily Settlement Price; - "F" (new value): "Final Settlement Price" – The dissemination of the Summary message was triggered by the calculation of the Final Settlement Price (for Long Gilt only); - "R" (new value): "Reference Data (SOD)" – The dissemination of the Summary message was triggered by the availability of the reference data at start of day; - "O" (new value): "Open Interest update" – The dissemination of the Summary message was triggered by the availability of a new value for the open interest. 	Enhancements to dissemination of reference and settlement prices (6.2)