

1437	737285	8534	301233	9413	374224	346120	9674	33409	478182	187833	23768	140188	329128	308176	1417	777288	3194	281028	3418	374334	348220	8674
1410	1639	376369	408429	132125	35794	781038	148493	111549	488878	3018	288781	4626	389523	1689	387418	2139	378281	438788	138112	35784	781038	148489
9	18373	886036	80482	7478	567773	822	83883	264273	8287	78237	25470	7707	82396	382158	611414	98977	89188	48282	7478	567773	822	83883
1410	75288	6578	863881	4638	389488	1544	378412	434567	2545	184189	439495	413501	1602	218788	1639	7318	8318	945187	4818	385400	15284	378412
121	302	797488	880378	884875	821843	417234	7788	427848	480728	9586	143847	1547	528499	7436	348221	438	787488	883078	484871	822843	417234	7784
1	143881	881824	871884	801	827818	5248	138284	188813	8678	348877	237221	138823	888448	388833	424479	24783	881824	871884	801	827818	5248	138284
8764	807	703	268332	8323	278881	2818	888144	148828	8820	748588	1888	4228	978428	381888	9714	828	703	268332	8323	278881	2818	888144
1	133887	488888	888888	888888	888888	888888	888888	888888	888888	888888	888888	888888	888888	888888	888888	888888	888888	888888	888888	888888	888888	888888
813	188888	4488	187738	712121	788828	9318	84848	9348	118488	3788	123888	7284	18844	888845	73212	888888	4488	187738	712121	788828	9318	84848
010	888888	788874	1638	188888	1838	88888	787818	888888	888888	888888	888888	888888	888888	888888	888888	888888	888888	888888	888888	888888	888888	888888
288138	187827	818818	143178	1141	789488	844881	428843	228843	228888	6407	488888	488184	488822	478144	9588	288138	187827	818818	143178	1141	789488	844881
1	884	488827	188888	388128	388784	123842	8648	428423	773883	488817	82888	12824	1828	48888	884	488827	188888	388128	388784	123842	8648	428423
7510%	388833	888433	888833	388433	888833	388433	888833	388433	888833	388433	888833	388433	888833	388433	888833	388433	888833	388433	888833	388433	888833	388433
23.78%	488488	11488%	888488	231818	788127	1678%	888488	231818	788127	1678%	888488	231818	788127	1678%	888488	231818	788127	1678%	888488	231818	788127	1678%
1	848182	4878%	888182	7888%	122771	888182	7888%	122771	888182	7888%	122771	888182	7888%	122771	888182	7888%	122771	888182	7888%	122771	888182	7888%
888	781871	888488	888822	1888%	388488	412888	388788	4481%	888488	888822	1888%	388488	412888	388788	4481%	888488	888822	1888%	388488	412888	388788	4481%
8810%	888881	488144	888133	617718	878888	878841	488482	882211	8221%	888488	888822	1888%	388488	412888	388788	4481%	888488	888822	1888%	388488	412888	388788
881	888881	188%	888182	2248%	888881	1234%	888881	488752	888881	888881	888881	888881	888881	888881	888881	888881	888881	888881	888881	888881	888881	888881
888787	888051	287884	888738	481%	888412	121788	388888	8488%	888051	287884	888738	481%	888412	121788	388888	8488%	888051	287884	888738	481%	888412	121788
8884%	881281	888788	881811	888888	1877%	881888	888888	888888	1877%	881888	888888	888888	1877%	881888	888888	888888	1877%	881888	888888	888888	1877%	881888
147488	888844	887812	1033%	888128	7888%	888178	888888	888888	4384	1888%	887488	888888	888888	888888	888888	888888	888888	888888	888888	888888	888888	888888
738828	1888%	887787	888131	223125	821888	488888	488178	1838%	887787	888131	223125	821888	488888	488178	1838%	887787	888131	223125	821888	488888	488178	1838%
814888	188888	342284	707122	888122	113811	888888	818888	888122	113811	888888	818888	888122	113811	888888	818888	888122	113811	888888	818888	888122	113811	888888
1481	1888%	884888	2741%	888133	1184%	888177	1234%	884888	2741%	888133	1184%	888177	1234%	884888	2741%	888133	1184%	888177	1234%	884888	2741%	888133
8188%	881281	888128	888128	888128	888128	888128	888128	888128	888128	888128	888128	888128	888128	888128	888128	888128	888128	888128	888128	888128	888128	888128



SOLA - Oslo Børs Derivatives market

OSLSOLA 005 SOLA 9 Interface Updates

Issue 1.0
5 August 2016



Important note

This document has been produced by Oslo Børs to assist customers in the use of the SOLA platform on the Oslo Børs market place. Part of the documentation is based on documentation from the London Stock Exchange Group. For more details, please see references in the appendix.

If you have any general queries relating to this document, please email:

technicalsupport@oslobors.no

Further copies of this document can also be downloaded from the Oslo Børs website at the following link:

http://www.oslobors.no/ob_eng/Oslo-Boers/Trading/Trading-systems/SOLA

Disclaimer

This document has been prepared on the basis of the best information available. Oslo Børs has taken reasonable efforts to ensure that the information in this publication is correct at the time of publication, but shall not be liable for decisions made in reliance on it. Oslo Børs will seek to provide notice to customers of changes being made to this document, but this notice cannot be guaranteed. Therefore, please note that this publication may be updated at any time. The information contained is therefore for guidance only. This document does not form part of the contractual documentation between the Oslo Børs and its customers.



Change log

This document can be updated at any time, and has been through the following iterations:

Issue	Date	Description
1.0	5 August 2016	Initial document release

Please note that only the latest issue of this document will be available from the Oslo Børs website. Details of the changes made in each issue of the document are described in the appendix.



1. Introduction

Oslo Børs uses SOLA for trading in standardized derivatives. SOLA is recognized as one of the world's leading trading systems for both options and futures. SOLA is developed by The Montreal Exchange, and has been used for derivatives trading at Oslo Børs since December 2009.

1.1 Purpose

This document provides a high level description of the changes introduces in the SOLA 9 upgrade to the HSVF, SAIL and FIX Protocols.

1.2 Readership

The SOLA 9 release contain changes designed for the various markets utilizing the SOLA 9 platform, but not all of the changes introduced are used in all markets. In the following sections, an indication will be given to show if the change is utilized by Oslo Børs or not, but for completeness all changes are included.

Messages are highlighted in **bold text**. Fields within messages are indicated by use of *italic* letters. References to other documents in the series are indicated by use of *underlined italic* letters.

1.3 Document series

This document is a part of a series of documents providing a holistic view of full trading and information services available from Oslo Børs post the upgrade to the SOLA 9 platform.

The current series of documents are outlined below:

General

OSLSOLA 005 SOLA 9 Interface Updates

Trading

OSLSOLA 201 FIX Business Design Guide

OSLSOLA 202 FIX Specification Guide

OSLSOLA 203 SAIL Business Design Guide

OSLSOLA 204 SAIL Specification Guide

Market Data

OSLSOLA 301 HSVF Specification Guide

The latest version of this documentation series can be found on:

http://www.oslobors.no/ob_eng/Oslo-Boers/Trading/Trading-systems/SOLA



2. What's New

2.1 Fix Drop Copy

It will be possible for all third party application developers to get access to the Drop Copy service via the application programming interface of their choice. This entails extending the existing Drop Copy access to include a FIX interface (including current SAIL Drop Copy native messages subscribed).

2.2 Exchange for Physical Trade Marker

A process for manual registration of Exchange For Physical (EFP) trades will be in place with the following characteristics:

- Trades will be inserted by the Exchange with a dedicated Exchange for Physical marker
- Trade will be disseminated via HSVF at the moment of creation of the trade (WT) as it is today. It is a requirement that a dedicated marker for Exchange for Physical is disseminated.
- Trades will be disseminated via all internal and external protocols with a dedicated trader marker E: Exchange for Physical
- Quantities can be below or above configured BTF minimum quantity.
- Prices can be outside spread.
- EFP trades will impact only volume statistics.

2.3 Pre Trade Validation

The functionality provides a means for Risk Managers to impose maximum position and limits on the trading participants (i.e. Trader IDs or if possible a group of Trader IDs) for which they are responsible.

Every time a participant's order book or traded position changes, their current position and exposure is recalculated and this, together with the limits set, will determine the maximum size allowed for an order or quote. Every time a participant submits a new or revised order or quote, it is checked against this "maximum size allowed" limit and be rejected if it exceeds it.

Every order (every quote) goes through the Pre-Trade Risk Checks and each one has to be completely processed through these checks before a new order for the same underlying can be evaluated and accepted/rejected by the system. In other words, the exposure calculation is completed for the previous order before a new order for the same underlying can be accepted/rejected.

2.4 Adding timestamp to HSVF Protocol

The High Speed Vendor Feed (HSVF) market data feed will include time-stamps for all market update messages. The requirement is that events need to be recorded, and messages disseminated, with time-stamps at least with millisecond granularity (ideally to the nearest millisecond).

3. Message Impacts

In order to introduce the new functionalities, enhancements to the existing version of SOLA protocols will be implemented in the new SOLA 9.2 version. New protocol versions will be created downstream systems:

- SAIL to protocol version A5
- FIX protocol 4.2
- HSVF to protocol version E6

4. Protocol Modifications

This chapter highlights the impacts on the protocols HSVF, SAIL and FIX. Below, there is the list of the protocol flows that will be subjected to changes. For each flow the names of the messages impacted and the update type is provided.

Possible update types:

- New value:** the format of the message has not changed, but new values are supported for a specific field;
- Added field:** new field added to an existing message that will impact the length.
- New message:** introduction of a new message.

Protocol	Msg Type	Message Name	Flow	Nature of change
HSVF	All		Incoming/ Outgoing	Modified message: Added Time field in Message Header Support for different Timezones in Time field
	C	Option Trade	Outgoing	Modified message: Modified values for field Exchange ID Extended values for field Price Indicator Marker
	CF	Futures Trade	Outgoing	Modified message: Modified values for field Exchange ID Extended values for field Price Indicator Marker
	CS	Strategy Trade	Outgoing	Modified message: Modified values for field Exchange ID Extended values for field Price Indicator Marker
	D	Option Request for Quote (RFQ)	Outgoing	Modified message: Modified values for field Exchange ID
	DF	Futures Request for Quote (RFQ)	Outgoing	Modified message: Modified values for field Exchange ID
	DS	Strategy Request for Quote (RFQ)	Outgoing	Modified message: Modified values for field Exchange ID

Protocol	Msg Type	Message Name	Flow	Nature of change
	E	Instrument Schedule Notice Option	Outgoing	Modified message: Modified values for field Exchange ID
	EB	Instrument Schedule Notice Futures Option	Outgoing	Modified message: Modified values for field Exchange ID
	EF	Instrument Schedule Notice Future	Outgoing	Modified message: Modified values for field Exchange ID
	ES	Instrument Schedule Notice Strategy	Outgoing	Modified message: Modified values for field Exchange ID
	F	Option Quote	Outgoing	Modified message: Modified values for field Exchange ID
	FF	Futures Quote	Outgoing	Modified message: Modified values for field Exchange ID
	FS	Strategy Quote	Outgoing	Modified message: Modified values for field Exchange ID
	GC	Group Status Schedule Notice	Outgoing	Modified message: Modified values for field Exchange ID
	GR	Group Status	Outgoing	Modified message: Modified values for field Exchange ID
	GS	Group Status (Strategies)	Outgoing	Modified message: Modified values for field Exchange ID
	H	Option Market Depth	Outgoing	Modified message: Modified values for field Exchange ID
	HF	Futures Market Depth	Outgoing	Modified message: Modified values for field Exchange ID
	HS	Strategy Market Depth	Outgoing	Modified message: Modified values for field Exchange ID
	I	Option Trade Cancellation	Outgoing	Modified message: Modified values for field Exchange ID Extended values for field Price Indicator Marker
	IF	Futures Trade Cancellation	Outgoing	Modified message: Modified values for field Exchange ID Extended values for field Price Indicator Marker
	IS	Strategy Trade Cancellation	Outgoing	Modified message: Modified values for field Exchange ID

Protocol	Msg Type	Message Name	Flow	Nature of change
	J	Option Instrument Keys	Outgoing	Modified message: Modified values for field Exchange ID
	JF	Futures Instrument Keys	Outgoing	Modified message: Modified values for field Exchange ID
	JS	Strategy Instrument Keys	Outgoing	Modified message: Modified values for field Exchange ID
	N	Option Summary	Outgoing	Modified message: Modified values for field Exchange ID
	NF	Futures Summary	Outgoing	Modified message: Modified values for field Exchange ID
	NS	Strategy summary	Outgoing	Modified message: Modified values for field Exchange ID
	Q	Beginning of Options Summary	Outgoing	Modified message: Modified values for field Exchange ID
	QB	Beginning of Futures Options Summary	Outgoing	Modified message: Modified values for field Exchange ID
	QF	Beginning of Futures Summary	Outgoing	Modified message: Modified values for field Exchange ID
	QS	Beginning of Strategy Summary	Outgoing	Modified message: Modified values for field Exchange ID
	U	End of transmission	Outgoing	Modified message: Modified values for field Exchange ID
	RS	Connection Message	Incoming	Modified message: New value for field HSVF Protocol Version
SAIL	All	All	Incoming/ Outgoing	Modified message: Support for different Timezones in Time field
	BP	Best Price Setter Notice	Outgoing	New message: New field type Best Price Setter
	ER	Error Notice	Outgoing	Modified field New values for <i>Error Code</i>
	KB	Proposal Acknowledgment	Outgoing	Modified field New values for <i>Order Status</i>
	KE	Order Acknowledgment	Outgoing	Modified field New values for <i>Status</i>
	KM	Order Modification Acknowledgment	Outgoing	Modified field

Protocol	Msg Type	Message Name	Flow	Nature of change
				New values for <i>Status</i>
	KZ	Order Cancellation Acknowledgment	Outgoing	Modified field New values for <i>Status</i>
	LA	Bulk Command Acknowledge	Outgoing	Modified field New values for <i>Error Code</i>
	LB	Bulk Command Message Acknowledge	Outgoing	New message New values for <i>Error Code</i>
	MK	Risk Limits Configuration	Incoming	New message New field type <i>Short Trader ID</i>
	MQ	MMP Parameters Configuration	Incoming	New message
	MN	Risk Limits Usage Notice	Outgoing	New message New field type <i>Short Trader ID</i> New field type <i>Risk Limit Type</i>
	NL	Leg Execution Notice	Outgoing	Modified message: Extended values for Special Trade Indicator
	NQ	MMP Parameters Update Notice	Outgoing	New message
	NT	Execution Notice	Outgoing	Modified message: Extended values for Special Trade Indicator
	NZ	Order Cancellation Notice (by system)	Outgoing	Modified field New values for <i>Status</i>
	PN	Proposal Notice	Outgoing	Modified field New values for <i>Order Status</i>
	PU	Proposal Update	Outgoing	Modified field New values for <i>Order Status</i>
	RT	Risk Master Switch	Incoming	New message New field type <i>Short Trader ID</i>
	TC	User Connection	Incoming	Modified message: New value for Protocol Version field
	TE	Technical Error Notice	Outgoing	Modified field New values for <i>Error Code</i>
	TH	Heartbeat (Outbound)	Outgoing	Modified message: New value for Protocol Version field
	TI	Heartbeat (Inbound)	Incoming	Modified message: New value for Protocol Version field
	TO	Out of Sequence	Outgoing	Modified message: New value for Protocol Version field



Protocol	Msg Type	Message Name	Flow	Nature of change
	TT	End of Transmission	Outgoing	Modified message: New value for Protocol Version field
FIX	35 = 8	Execution Report	Outgoing	Modified message: New TAG [BestPriceSetter 16455] in Execution Report [MsgType 35 = 8] Extended values for TAG [SpecialTradeInd 9459] in Execution Report [MsgType 35 = 8] New Values for TAG [OrdStatus 39]
	35 = 9	Order Cancel Reject	Outgoing	Modified tag New Values for TAG [OrdStatus 39]
FIX DC	35 = A	Logon	Incoming/ Outgoing	New FIX Drop Copy Gateway: Administrative messages available
	35 = 0	Heartbeat	Incoming/ Outgoing	New FIX Drop Copy Gateway: Administrative messages available
	35 = 1	Test Request	Incoming	New FIX Drop Copy Gateway: Administrative messages available
	35 = 2	Resend Request	Incoming	New FIX Drop Copy Gateway: Administrative messages available
	35 = 3	FIX Protocol Error / Reject	Outgoing	New FIX Drop Copy Gateway: Administrative messages available
	35 = 4	Sequence Reset	Incoming	New FIX Drop Copy Gateway: Administrative messages available
	35 = 5	Logout	Incoming/ Outgoing	New FIX Drop Copy Gateway: Administrative messages available
	35 = 8	Execution Report	Outgoing	New FIX Drop Copy Gateway: Drop Copy user to receive a copy of all order acknowledgements and trade notifications ([MsgType 35 = 8]) that belong to the member New Values for TAG [OrdStatus 39]

111.014	30.871	881.030	90.832	74.79	647.271	8.23	70.892	284.279	86.41	73.117	334.930	27.07	303.040	30.139	411.834	13.833	994.026	50.982	74.36	342.271	8.23	90.802	344.819	86.41	70.822	304.870	27.07				
218.008	76.08	79.938	64.79	938.120	46.10	180.400	11.94	278.623	634.507	25.46	434.280	428.680	453.956	66.20	412.289	75.20	71.998	83.70	293.327	46.10	180.400	278.619	834.507	25.46	434.280	428.680	453.956	66.20			
74.04%	640.721	1.00	797.430	956.879	844.071	652.949	417.224	77.64	677.446	480.720	18.46	183.041	19.87	420.940	74.90	345.221	1.00	797.430	962.078	844.071	652.949	77.64	427.046								
39	474.471	14.283	281.214	671.944	1.02	337.010	67.40	120.024	160.816	21.78	345.577	237.229	220.030	880.449	999.830	474.471	14.283	281.214	671.944	1.02	337.010	67.40	120.024	160.816	21.78	345.577	237.229	220.030	880.449		
390.881	97.84	8.07	7.80	283.632	83.32	278.920	65.20	860.144	340.426	80.20	746.640	14.69	43.20	379.429	391.863	97.84	8.07	7.80	283.632	83.32	278.920	65.20	860.144	340.426	80.20	746.640	14.69	43.20	379.429		
104%	781.861	133.001	343.200	882.830	232.110	437.200	400.830	89.892	301.891	82.00	495.897	320.200	170.40	30.20	93.04	133.001	133.001	343.200	882.830	232.110	437.200	400.830	89.892	301.891	82.00	495.897	320.200	170.40	30.20	93.04	
4.813	22.612	200.938	46.88	187.130	712.110	790.828	212.0	14.949	13.49	119.400	67.86	123.200	12.84	18.84	300.010	22.612	200.938	46.88	187.130	712.110	790.828	212.0	14.949	13.49	119.400	67.86	123.200	12.84	18.84	300.010	
627.00%	959.031	980.831	294.676	14.30	240.000	16.20	86.44	727.762	604.045	381.570	370.204	941.531	793.794	31.20	57.20	895.020	980.831	294.676	14.30	240.000	16.20	86.44	727.762	604.045	381.570	370.204	941.531	793.794	31.20	57.20	895.020
14	56.00%	200.120	257.817	518.878	149.178	11.61	789.409	864.491	129.841	129.966	54.02	400.798	100.154	409.422	479.344	56.10	200.120	257.817	518.878	149.178	11.61	789.409	864.491	129.841	129.966	54.02	400.798	100.154	409.422	479.344	
100	334.579	1.04	463.815	204.938	303.629	187.723	313.043	16.49	419.432	77.000	439.317	52.040	27.24	16.71	40.380	334.579	1.04	463.815	204.938	303.629	187.723	313.043	16.49	419.432	77.000	439.317	52.040	27.24	16.71	40.380	
410.031	26.03%	309.810	600.420	98.03%	334.420	950.862	213.200	42.881	43.10%	431.420	41.43%	210.750	68.52%	703.420	430.431	26.03%	309.810	600.420	98.03%	334.420	950.862	213.200	42.881	43.10%	431.420	41.43%	210.750	68.52%	703.420	430.431	



Appendix 2 - References

References to external resources are given below.

Technical information for the SOLA 7 Upgrade from LSEDM:

<http://www.lseg.com/derivatives/document-library>