London
Stock Exchange Group

SOLA Derivatives

HSVF Market Data

Technical Specification

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1 Introduction

1.1 Purpose

The purpose of this publication is to provide participants with the knowledge and technical details necessary for accessing and using the Exchange derivatives market data feed.

The High Speed Vendor Feed (HSVF) is comprised of trades, quotes, market depth, strategies, bulletins, summaries and other statistics.

This HSVF market data specification defines the communications interface and message formats for the high-speed transmission which broadcasts real-time trading and statistical information from the Exchange derivatives platform.

1.2 Readership

The target audience for this publication is the business or Information Technology level of an organisation interested in the functional design of the Exchange derivatives platform.

1.3 Revision History

Issue	Date
1.0	21 December 2010
1.1	04 March 2011
1.2	04 April 2011
1.3	15 April 2011
1.4	28 June 2011
1.5	29 July 2011
1.6	19 March 2012
2.0	27 July 2012

2 Overview

The High Speed Vendor Feed (HSVF) market data feed uses a TCP/IP broadcast interface. Each message type is fixed in format and messages are non-blocked (i.e. the Exchange does not wait for an acknowledgement before sending the following message) re-transmission of any data is available. HSVF messages consist of a standard message header followed by the message body which varies in format according to the message type.

2.1 Transmission format

Each message is framed by an STX and an ETX character. The format used is:

STX	MESSAGE HEADER	MESSAGE	ETX

STX and ETX indicate the beginning and the end of the record being transmitted.

2.2 Message Header

The standard message header attached to all messages has the following format:

Field Name	L	T	Definition / Validation Rules
Sequence Number	9	N	Each message is assigned a sequence number starting at '000000001' every day and incremented by 1 for each message sent. The sequence numbers will range from 000000001 to 999999999 (decimal, ASCII) with wrap around. ***Note:*** *Retransmitted messages will contain the original sequence numbers.*
Message Type	2	X	Identifies the type of message being sent. Format is left- aligned, right 'blank' filled (if necessary).

2.3 Transmission capability

The following table describes Transmission Capability. For formatting details on examples shown, refer to the Message Type RS - Connection Message - Min. 32 / Max. 6026 bytes.

Normal Connection (i.e. Start of Day)	1) Participant connects to specified port 2) Participant sends RS message type ex. 000000001RS0000000000Y NYYN0E4000 3) The Exchange sends data to Participant with: • Starting sequence number 000000001 • Regular market messages on Options, not Futures • Market depth messages for all Trading Instruments • Regular market messages and Strategies for all Trading Instruments • Regular market messages with Summaries • GAP Control: 0 (will receive GAP messages) • Protocol version E4 • All options classes
RETRANSMISSION -A- (REQUESTING TO RECEIVE FROM BEGINNING OF THE DAY)	1) Participant connects to specified port 2) Participant sends RS message type ex. 000000001RS**0000000000**Y NYYN0E4000 3) The Exchange resends all messages disseminated so far through out the day
RETRANSMISSION -B- (REQUESTING THE NEXT MESSAGE IN LINE)	1) Participant connects to specified port 2) Participant sends RS message type ex. 000000001RS**9999999999**Y NYYN0E4000 3) The Exchange sends the next message to Participant
RETRANSMISSION -C- (FROM A SPECIFIC SEQUENCE NUMBER)	1) Participant connects, if disconnected to specified port 2) Participant sends RS message type ex. 000000001RS**0000013247**Y NYYN0E4000 3) The Exchange sends all messages with sequence numbers greater than 13247 ***Note:*** *If the Exchange's sequence number is lower than participant's, transmission will begin with the next message*
DISCONNECTION	1) Participant disconnects from port

Notes:

1) For a retransmission (type 'A' or 'C'), participants should keep the same parameters (Type of market data / GAP Control / Option classes requested).

2) Participants are required to reconnect every day. If they do not disconnect, their connection is disabled by the Exchange at the end of the day.

3 Messages

3.1 Message types

Listed below is a summary of all message types that are transmitted on HSVF.

3.1.1 Trade Messages

C	Option Trade
CF	Future Trade
CS	Strategy Trade

3.1.2 Request for Quote Messages (RFQ)

D	Option Request for Quote
DF	Future Request for Quote
DS	Strategy Request for Quote

3.1.3 Quote Messages

F	Option Quote
FF	Future Quote
FS	Strategy Quote

3.1.4 Market Depth Messages

H	Option Market Depth
HB	Futures Option Market Depth
HF	Future Market Depth
HS	Strategy Market Depth

3.1.5 Trade Cancellation Messages

I	Option Trade Cancellation
IF	Future Trade Cancellation
IS	Strategy Trade Cancellation

3.1.6 Instrument Keys Messages

J	Options Instrument Keys
JB	Futures Option Instrument Keys
JF	Future Instrument Keys
JS	Strategy Instrument Keys

3.1.7 Summary Messages

N	Option Summary
NB	Futures Option Summary
NF	Future Summary
NS	Strategy Summary

Summary messages are sent:

- At the beginning of the day to define the instruments traded on that day
- After a trade cancellation if extreme values have been changed (Open/High/Low/Last)
- At the end of the day with relevant data such as the Open/High/Low/Last/Volume
- During the day if a new instrument is added

3.1.8 Beginning of Summary Messages

Q	Beginning of Option Summary
QB	Beginning of Furutres Option Summary
QF	Beginning of Futures Summary
QS	Beginning of Strategy Summary

3.1.9 Instrument Schedule Notice Messages

E	Instrument Schedule Notice Option
EB	Instrument Schedule Notice Futures Option
EF	Instrument Schedule Notice Future
ES	Instrument Schedule Notice Strategy

3.1.10 Other Messages

GR	Group Status
GS	Group Status (Strategies)
GC	Group Status Schedule Notice
L	Bulletins
RS	Connection Message
S	End of Sales
U	End of Transmission
V	Circuit Assurance ("Heartbeat")
W	Gap Sequence

3.2 Message Record Format and definitions

3.2.1 Basic conventions

- Whenever a field is indicated as being blank it contains the ASCII space character (hex 20).
- All numeric fields: Numbers (0 to 9), Right justified and zero filled.
- All alphanumeric fields (except 'Strategy Symbol' and 'Instrument External Code'): All characters possible (numbers, letters, others), right justified, zero filled unless stated otherwise.
- 'Strategy Symbol' and 'Instrument External Code' alphanumeric field: All characters possible, left justified, blank filled.
- All alphabetic fields: Letters (A to Z) left justified, blank filled unless stated otherwise.
- The 'Filler' field can have any format [numeric, alphanumeric, ASCII space character (hex 20)].

In the following tables, the column **L** represents the length in bytes of the described field, and the column **T** ('Data Type') will be represented by the following characters. Refer to the above for a more detail description of each:

A = Alphabetic
N = Numeric
X = Alphanumeric

3.2.2 Message Type C - Option Trade - 72 Bytes

Field Name	L	T	Definition / Validation Rules
Message Header	11		Refer to paragraph "2.2"
Exchange ID	1	A	Exchange on which the trade occurred. I: IDEM E: Turquoise O: Oslo Bors
Symbol Root	6	A	Option base symbol (symbol of the underlying)
Expiry Year	2	N	Last two digits of the expiry year of the option
Expiry Month	1	A	Expiry month of the option
Expiry Day	2	N	Expiry day of the option
Call/Put Code	1	A	Values are: C = Call P = Put O = Over U = Under
Strike Price	7	N	Strike price of the option in full. Refer to chapter "5"
Strike Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph "4.3"
Corporate Action	1	A	Values are: X, Y, Z,Q,R,S,G,U,V : pending Corporate Action impacting contract Blank : no Corporate Action impacting contract
Volume	8	N	Number of contracts for the trade Refer to paragraph "6.4"
Trade Price	7	N	Price at which the transaction took place
Trade Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph "4.3"
Net Change Sign +/-	1	X	For the net change field
Net Change	7	N	Net change = last trade price - previous close
Net Change Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph "4.3"
Stamp Time	6	N	Time of transaction HHMMSS

Open Interest	7	N	Outstanding number of contracts in the series as of previous day Refer to paragraph “6.4”
Price Indicator Marker	1	X	Identifies the type of transaction Refer to paragraph “6.3”

3.2.3 Message Type CF - Futures Trade - 56 bytes

Field Name	L	T	Definition / Validation Rules
Message Header	11		Refer to paragraph “2.2”
Exchange ID	1	A	Exchange on which the trade occurred. I: IDEM E: Turquoise O: Oslo Bors
Symbol Root	6	A	Futures series symbol
Expiry Year	2	N	Last two digits of the expiry year of the future
Expiry Month	1	A	Expiry month of the future
Expiry Day	2	N	Expiry day of the future
Corporate Action	1	A	Values are: X, Y, Z,Q,R,S,G,U,V : pending Corporate Action impacting contract Blank : no Corporate Action impacting contract
Volume	8	N	Total number of contracts traded Refer to paragraph “6.4”
Trade Price	7	N	Price at which the transaction took place.
Trade Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”
Net Change Sign +/-	1	X	For net change field (sign)
Net Change	7	N	Net change = last trade price - previous settlement price
Net Change Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”
Stamp Time	6	N	Time of transaction HHMMSS
Price Indicator Marker	1	X	Identifies the type of transaction Refer to paragraph “6.3”

3.2.4 Message Type CS - Strategy Trade - 75 bytes

Field Name	L	T	Definition / Validation Rules
Message Header	11		Refer to paragraph “2.2”
Exchange ID	1	A	Exchange on which the trade occurred. I: IDEM E: Turquoise O: Oslo Bors
Symbol	30	X	Identification of the strategy The legs (underlying) are defined in message type NS Alphanumeric with ".","+","-"
Volume	8	N	Total number of contracts traded Refer to paragraph “6.4”
Trade Price Sign +/-	1	X	For Trade Price field (sign)
Trade Price	7	N	Price at which the transaction took place.
Trade Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”
Net Change Sign +/-	1	X	For net change field
Net Change	7	N	Net change = last trade price - previous close
Net Change Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”
Stamp Time	6	N	Time of transaction HHMMSS
Price Indicator Marker	1	X	Identifies the type of transaction Refer to paragraph “6.3”

3.2.5 Message Type D - Option Request for Quote (RFQ) - 41 bytes

Field Name	L	T	Definition / Validation Rules
Message Header	11		Refer to paragraph “2.2”
Exchange ID	1	A	Exchange on which the RFQ occurred. I: IDEM E: Turquoise O: Oslo Bors
Symbol Root	6	A	Option base symbol

Expiry Year	2	N	Last two digits of the expiry year of the option
Expiry Month	1	A	Expiry month of the option
Expiry Day	2	N	Expiry day of the option
Strike Price	7	N	Strike price of the option in full. Refer to chapter "5"
Strike Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph "4.3"
Corporate Action	1	A	Values are: X, Y, Z,Q,R,S,G,U,V : pending Corporate Action impacting contract Blank : no Corporate Action impacting contract
Size of the RFQ	8	X	Number of contracts for which the price is requested Refer to paragraph "6.4"

3.2.6 Message Type DF - Futures Request for Quote (RFQ) - 32 bytes

Field Name	L	T	Definition / Validation Rules
Message Header	11		Refer to paragraph "2.2"
Exchange ID	1	A	Exchange on which the RFQ occurred. I: IDEM E: Turquoise O: Oslo Bors
Symbol Root	6	A	Symbol for the Future series
Expiry Year	2	N	Last two digits of the expiry year of the future
Expiry Month	1	A	Expiry month of the future
Expiry Day	2	N	Expiry day of the future
Corporate Action	1	A	Values are: X, Y, Z,Q,R,S,G,U,V : pending Corporate Action impacting contract Blank : no Corporate Action impacting contract
Size of the RFQ	8	X	Number of contracts for which the price is requested Positive whole number Refer to paragraph "6.4"

3.2.7 Message Type DS - Strategy Request for Quote (RFQ) - 50 bytes

Field Name	L	T	Definition / Validation Rules
Message Header	11		Refer to paragraph "2.2"

Exchange ID	1	A	Exchange on which the RFQ occurred. I: IDEM E: Turquoise O: Oslo Bors
Symbol	30	X	Identification of the strategy The legs (underlying) are defined in message type NS. Alphanumeric with "."."+"."-"
Size of the RFQ	8	X	Number of contracts for which the price is requested Positive whole number Refer to paragraph "6.4"

3.2.8 Message Type E - Instrument Schedule Notice Option

Field Name	L	T	Definition / Validation Rules
Message Header	11		Refer to paragraph "2.2"
Exchange ID	1	A	Exchange on which the group status notice occurred. I: IDEM E: Turquoise O: Oslo Bors
Symbol Root	6	X	Root of the instrument group
Expiry Year	2	N	
Expiry Month	1	N	
Expiry Day	2	N	
Call/Put Code	1	A	Values are: C = Call P = Put O = Over U = Under
Strike Price	7	N	Strike price of the option in full. Refer to chapter "5"
Strike Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph "4.3"
Corporate Action	1	A	
Scheduled Instrument Status	1	A	Indicates Instrument Status Marker Refer to paragraph "6.2"

Scheduled Status Change Time	6	Time	

3.2.9 Message Type EB - Instrument Schedule Notice Futures Option

Field Name	L	T	Definition / Validation Rules
Message Header	11		Refer to paragraph "2.2"
Exchange ID	1	A	Exchange on which the group status notice occurred. I: IDEM E: Turquoise O: Oslo Bors
Symbol Root	6	X	Root of the instrument group
Expiry Year	2	N	
Expiry Month	1	N	
Expiry Day	2	N	
Call/Put Code	1	A	Values are: C = Call P = Put O = Over U = Under
Strike Price	7	N	Strike price of the option in full. Refer to chapter "5"
Strike Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph "4.3"
Corporate Action	1	A	
Scheduled Instrument Status	1	A	Indicates Instrument Status Marker Refer to paragraph "6.2"
Scheduled Status Change Time	6	Time	

3.2.10 Message Type EF - Instrument Schedule Notice Future

Field Name	L	T	Definition / Validation Rules
Message Header	11		Refer to paragraph "2.2"

Exchange ID	1	A	Exchange on which the group status notice occurred. I: IDEM E: Turquoise O: Oslo Bors
Symbol Root	6	X	Root of the instrument group
Delivery Year	2	N	
Delivery Month	1	A	
Delivery Day	2	N	
Corporate Action	1	A	
Scheduled Instrument Status	1	A	Indicates Instrument Status Marker Refer to paragraph "6.2"
Scheduled Status Change Time	6	Time	

3.2.11 Message Type ES - Instrument Schedule Notice Strategy

Field Name	L	T	Definition / Validation Rules
Message Header	11		Refer to paragraph "2.2"
Exchange ID	1	A	Exchange on which the group status notice occurred. I: IDEM E: Turquoise O: Oslo Bors
Symbol	30	X	
Scheduled Instrument Status	1	A	Indicates Instrument Status Marker Refer to paragraph "6.2"
Scheduled Status Change Time	6	Time	

3.2.12 Message Type F - Option Quote - 60 bytes

Field Name	L	T	Definition / Validation Rules
Message Header	11		Refer to paragraph "2.2"

Exchange ID	1	A	Exchange on which the quote occurred. I: IDEM E: Turquoise O: Oslo Bors
Symbol Root	6	A	Option base symbol
Expiry Year	2	N	Last two digits of the expiry year of the option
Expiry Month	1	A	Expiry month of the option
Expiry Day	2	N	Expiry day of the option
Call/Put Code	1	A	Values are: C = Call P = Put O = Over U = Under
Strike Price	7	N	Strike price of the option in full. Refer to chapter "5"
Strike Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph "4.3"
Corporate Action	1	A	Values are: X, Y, Z,Q,R,S,G,U,V : pending Corporate Action impacting contract Blank : no Corporate Action impacting contract
Bid Price	7	N	Bid price for the option series
Bid Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph "4.3"
Bid Size	5	N	Number of option contracts represented by the Bid Price. If size is greater than 99999, the 5th character becomes an exponent Refer to paragraph "6.4"
Ask Price	7	N	Ask price for the option series
Ask Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph "4.3"
Ask Size	5	N	Number of option contracts represented by the Ask Price. If size is greater than 99999, the 5th character becomes an exponent Refer to paragraph "6.4"
Instrument Status Marker	1	A	Indicates Instrument Status Marker Refer to paragraph "6.2"

3.2.13 Message Type FF - Futures Quote - 51 bytes

Field Name	L	T	Definition / Validation Rules
Message Header	11		Refer to paragraph "2.2"
Exchange ID	1	A	Exchange on which the quote occurred. I: IDEM E: Turquoise O: Oslo Bors
Symbol Root	6	A	Symbol for the Future series
Expiry Year	2	N	Last two digits of the expiry year of the future
Expiry Month	1	A	Expiry month of the future
Expiry Day	2	N	Expiry day of the future
Corporate Action	1	A	Values are: X, Y, Z,Q,R,S,G,U,V : pending Corporate Action impacting contract Blank : no Corporate Action impacting contract
Bid Price	7	N	Bid price for the future contract
Bid Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph "4.3"
Bid Size	5	N	Number of futures contracts represented by the Bid Price. If size is greater than 99999, the 5th character becomes an exponent Refer to paragraph "6.4"
Ask Price	7	N	Ask Price for the future contract
Ask Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph "4.3"
Ask Size	5	N	The number of futures contracts represented by the Ask Price. If size is greater than 99999, the 5th character becomes an exponent Refer to paragraph "6.4"
Instrument Status Marker	1	A	Indicates Instrument Status Marker Refer to paragraph "6.2"

3.2.14 Message Type FS - Strategy Quote - 71 bytes

Field Name	L	T	Definition / Validation Rules
Message Header	11		Refer to paragraph “2.2”
Exchange ID	1	A	Exchange on which the quote occurred. I: IDEM E: Turquoise O: Oslo Bors
Symbol	30	X	Identification of the strategy The legs (underlying) are defined in message type NS. Alphanumeric with ".","+","-"
Bid Price Sign +/-	1	X	For Bid Price field
Bid Price	7	N	Bid price for the future contract
Bid Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”
Bid Size	5	N	Number of futures contracts represented by the Bid Price. If size is greater than 99999, the 5th character becomes an exponent Refer to paragraph “6.4”
Ask Price sign +/-	1	X	For Ask Price field
Ask Price	7	N	Ask price for the future contract
Ask Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”
Ask Size	5	N	The number of futures contracts represented by the Ask Price. If size is greater than 99999, the 5th character becomes an exponent Refer to paragraph “6.4”
Instrument Status Marker	1	A	Indicates Instrument Status Marker Refer to paragraph “6.2”

3.2.15 Message Type GR - Group Status - 21 bytes

This message will be sent when a group of trading instruments enters a new status:

Field Name	L	T	Definition / Validation Rules
Message Header	11		Refer to paragraph "2.2"
Exchange ID	1	A	Exchange on which the group status notice occurred. I: IDEM E: Turquoise O: Oslo Bors
Symbol Root	6	A	Root of the instrument group
Group Instrument	2	X	Group of the instrument
Group Status	1	A	Group status of the trading instrument Refer to paragraph "6.2"

3.2.16 Message Type GS - Group Status (Strategies) - 15 bytes

This message will be sent when a Strategy group of trading instruments enters a new status. All strategies have a predetermined group that can be found in the JS message (Strategy Instrument Keys message).

Field Name	L	T	Definition / Validation Rules
Message Header	11		Refer to paragraph "2.2"
Exchange ID	1	A	Exchange on which the group status notice occurred. I: IDEM E: Turquoise O: Oslo Bors
Group Instrument	2	X	Group of the instrument
Group Status	1	A	Group status of the trading instrument Refer to paragraph "6.2"

3.2.17 Message Type GC - Group Status Schedule Notice

Field Name	L	T	Definition / Validation Rules
Message Header	11		Refer to paragraph "2.2"
Exchange ID	1	A	Exchange on which the group status notice occurred. I: IDEM E: Turquoise O: Oslo Bors
Symbol Root	30	X	Root of the instrument group
Instrument Group	2	X	

Group Status	1	A	
Scheduled Time	6	N	

3.2.18 Message Type H - Option Market Depth - up to 190 bytes

Field Name	L	T	Definition / Validation Rules
Message Header	11		Refer to paragraph "2.2"
Exchange ID	1	A	Exchange on which the market depth message occurred. I: IDEM E: Turquoise O: Oslo Bors
Symbol Root	6	A	Option base symbol
Expiry Year	2	N	Last two digits of the expiry year of the option
Expiry Month	1	A	Expiry month of the option
Expiry Day	2	N	Expiry day of the option
Call/Put Code	1	A	Values are: C = Call P = Put O = Over U = Under
Strike Price	7	N	Strike price of the option in full. Refer to chapter "5"
Strike Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph "4.3"
Corporate Action	1	A	Values are: X, Y, Z,Q,R,S,G,U,V : pending Corporate Action impacting contract Blank : no Corporate Action impacting contract
Instrument Status Marker	1	A	Indicates Instrument Status Marker Refer to paragraph "6.2"
Number of Level	1	N	Number of level for the trading instrument 1 to 5
Level of Market Depth	1	A	Level of market depth 1 to 5: 1 to 5 levels A: Implied prices
Bid Price	7	X	Bid price for the option series or '____OUV' to represent a market order at the top of the book in a pre-auction phase.
Bid Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph "4.3"
Bid Size	5	N	Number of option contracts represented by the Bid Price. If size is greater than 99999, the 5th character becomes an exponent. Refer to paragraph "6.4"

Number of Bid Orders	2	X	Number of bid orders, present at a given moment in the order book If greater than 99 the 2nd character becomes an exponent. Refer to paragraph "6.4"
Ask Price	7	X	Ask price for the option series or '____OUV' to represent a market order at the top of the book in a pre-auction phase.
Ask Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph "4.3"
Ask Size	5	N	Number of option contracts represented by the Ask Price. If size is greater than 99999, the 5th character becomes an exponent. Refer to paragraph "6.4"
Number of Ask Orders	2	X	Number of Ask Orders, present at a given moment in the order book. If greater than 99 the 2nd character becomes an exponent. Refer to paragraph "6.4"

3.2.19 Message Type HF - Futures Market Depth - up to 181 bytes

Field Name	L	T	Definition / Validation Rules
Message Header	11		Refer to paragraph "2.2"
Exchange ID	1	A	Exchange on which the market depth message occurred. I: IDEM E: Turquoise O: Oslo Bors
Symbol Root	6	A	Symbol for the Future series
Expiry Year	2	N	Last two digits of the expiry year of the future
Expiry Month	1	A	Expiry month of the future
Expiry Day	2	N	Expiry day of the future
Corporate Action	1	A	Values are: X, Y, Z,Q,R,S,G,U,V : pending Corporate Action impacting contract Blank : no Corporate Action impacting contract
Instrument Status Marker	1	A	Indicates Instrument Status Marker Refer to paragraph "6.2"
Number of Level	1	N	Number of level for the trading instrument 1 – 5
Level of Market Depth	1	A	Level of market depth 1 to 5: 1 to 5 levels A: Implied prices
Bid Price	7	X	Bid price for the future contract or '____OUV' to represent a market order at the top of the book in a pre-auction phase.
Bid Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph "4.3"

Bid Size	5	N	Number of futures contracts represented by the Bid Price. If size is greater than 99999, the 5th character becomes an exponent.Refer to paragraph “6.4”
Number of Bid Orders	2	X	Number of Bid Orders, present at a given moment in the order book If greater than 99 the 2nd character becomes an exponent
Ask Price	7	X	Ask Price for the future contract or ‘____OUV’ to represent a market order at the top of the book in a pre-auction phase.
Ask Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”
Ask Size	5	N	The number of futures contracts represented by the Ask Price. If size is greater than 99999, the 5th character becomes an exponent. Refer to paragraph “6.4”
Number of Ask Orders	2	X	Number of Ask Orders, present at a given moment in the order book. If greater than 99 the 2nd character becomes an exponent Refer to paragraph “6.4”

3.2.20 Message Type HS - Strategy Market Depth - up to 209 bytes

Field Name	L	T	Definition / Validation Rules
Message Header	11		Refer to paragraph “2.2”
Exchange ID	1	A	Exchange on which the market depth message occurred. I: IDEM E: Turquoise O: Oslo Bors
Symbol	30	X	Identification of the strategy. The legs (underlying) are defined in message type NS Alphanumeric with ".","+","-"
Instrument Status Marker	1	A	Indicates Instrument Status Marker Refer to paragraph “6.2”
Number of Level	1	N	Number of level for the trading instrument 1 – 5
Level of Market Depth	1	A	Level of market depth 1 to 5: 1 to 5 levels A: Implied prices
Bid Price Sign +/-	1	X	For the Bid Price field
Bid Price	7	X	Bid price for the future contract or ‘____OUV’ to represent a market order at the top of the book in a pre-auction phase.

Bid Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph "4.3"
Bid Size	5	N	Number of futures contracts represented by the Bid Price. If size is greater than 99999, the 5th character becomes an exponent Refer to paragraph "6.4"
Number of Bid Orders	2	X	Number of Bid Orders, present at a given moment in the order book If greater than 99 the 2nd character becomes an exponent Refer to paragraph "6.4"
Ask Price Sign +/-	1	X	For the Ask Price field.
Ask Price	7	X	Ask price for the future contract or '____OUV' to represent a market order at the top of the book in a pre-auction phase.
Ask Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph "4.3"
Ask Size	5	N	The number of futures contracts represented by the Ask Price. If size is greater than 99999, the 5th character becomes an exponent. Refer to paragraph "6.4"
Number of Ask Orders	2	X	Number of Ask Orders, present at a given moment in the order book If greater than 99 the 2nd character becomes an exponent. Refer to paragraph "6.4"

3.2.21 Message Type I - Option Trade Cancellation - 63 bytes

A cancellation will reduce the total volume, value and transactions by the amount of the cancelled trade. A cancellation message is followed by an Options Summary message (message type N) which will reflect the corrected market.

Field Name	L	T	Definition / Validation Rules
Message Header	11		Refer to paragraph "2.2"
Exchange ID	1	A	Exchange on which the trade occurred. I: IDEM E: Turquoise O: Oslo Bors
Symbol Root	6	A	Option base symbol
Expiry Year	2	N	Last two digits of the expiry year of the option
Expiry Month	1	A	Expiry month of the option
Expiry Day	2	N	Expiry day of the option

Call/Put Code	1	A	Values are: C = Call P = Put O = Over U = Under
Strike Price	7	N	Strike price of the option in full. Refer to chapter "5"
Strike Price Fraction Indicator	1	X	Defines fraction or multiplier positions. positions. Refer to paragraph "4.3"
Corporate Action	1	A	Values are: X, Y, Z,Q,R,S,G,U,V : pending Corporate Action impacting contract Blank : no Corporate Action impacting contract
Volume	8	N	Number of contracts being cancelled Refer to paragraph "6.4"
Trade Price	7	N	Price at which the transaction took place
Trade Price Fraction Indicator	1	X	Defines fraction or multiplier positions. positions. Refer to paragraph "4.3"
Stamp Time	6	N	Time of the option trade HHMMSS
Open Interest	7	N	Outstanding number of contracts in the series as of the previous day Refer to paragraph "6.4"
Price Indicator Marker	1	X	Identifies the type of transaction Refer to paragraph "6.3"

3.2.22 Message Type IF - Futures Trade Cancellation - 47 bytes

A cancellation will reduce the total volume, value and transactions by the amount of the cancelled trade. A cancellation message is followed by a Future Summary message (message type NF) which will reflect the corrected market.

Field Name	L	T	Definition / Validation Rules
Message Header	11		Refer to paragraph "2.2"
Exchange ID	1	A	Exchange on which the trade occurred. I: IDEM E: Turquoise O: Oslo Bors
Symbol Root	6	A	Futures series symbol
Expiry Year	2	N	Last two digits of the expiry year of the option
Expiry Month	1	A	Expiry month of the option
Expiry Day	2	N	Expiry day of the option

Corporate Action	1	A	Values are: X, Y, Z,Q,R,S,G,U,V : pending Corporate Action impacting contract Blank : no Corporate Action impacting contract
Volume	8	N	Number of contracts being cancelled Refer to paragraph "6.4"
Trade Price	7	N	Price at which the transaction took place
Trade Price Fraction Indicator	1	X	Defines fraction or multiplier positions. positions. Refer to paragraph "4.3"
Stamp Time	6	N	Time of the futures trade HHMMSS
Price Indicator Marker	1	X	Identifies the type of transaction Refer to paragraph "6.3"

3.2.23 Message Type IS - Strategy Trade Cancellation - 65 bytes

A cancellation will reduce the total volume, value and transactions by the amount of the cancelled trade. A cancellation message is followed by a Strategy Summary message (message type NS) which will reflect the corrected market.

Field Name	L	T	Definition / Validation Rules
Message Header	11		Refer to paragraph "2.2"
Exchange ID	1	A	Exchange on which the trade occurred. I: IDEM E: Turquoise O: Oslo Bors
Symbol	30	X	Identification of the strategy The legs (underlying) are defined in message type NS. Alphanumeric with "."."+","-"
Volume	8	N	Number of contracts being cancelled Refer to paragraph "6.4"
Trade Price sign +/-	1	X	For the Trade Price field
Trade Price	7	N	Price at which the transaction took place
Trade Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph "4.3"
Stamp Time	6	N	Time of the futures trade HHMMSS

3.2.24 Message Type J - Option Instrument Keys - 143 bytes

Field Name	L	T	Definition / Validation Rules
Message Header	11		Refer to paragraph "2.2"
Exchange ID	1	A	Exchange on which the instrument is listed. I: IDEM E: Turquoise O: Oslo Bors
Symbol Root	6	A	Option base symbol (symbol of the underlying)
Expiry Year	2	N	Last two digits of the expiry year of the option
Expiry Month	1	A	Expiry month of the option
Expiry Day	2	N	Expiry day of the option
Call/Put Code	1	A	Values are: C = Call P = Put O = Over U = Under
Strike Price	7	N	Strike price of the option in full. Refer to chapter "5"
Strike Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph "4.3"
Corporate Action	1	A	Values are: X, Y, Z,Q,R,S,G,U,V : pending Corporate Action impacting contract Blank : no Corporate Action impacting contract
Strike Price Currency	3	X	Currency used for the Option Strike Price Refer to paragraph "6.5"
Maximum Number of Contracts per Order	6	N	Maximum authorized number of contract per order Refer to paragraph "6.4"
Minimum Number of Contracts per Order	6	N	Minimum authorized number of contract per order Refer to paragraph "6.4"
Maximum Threshold Price	7	N	Maximum threshold price authorized for an option contract Refer to paragraph "6.4"
Maximum Threshold Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph "4.3"

Minimum Threshold Price	7	N	Minimum threshold price authorized for an option contract Refer to paragraph “6.4”
Minimum Threshold Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”
Tick Increment	7	N	Precision with which the price of an order limit can be expressed Refer to paragraph “5.1”
Tick Increment Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”
Option type	1	A	Type of option "A" for American "E" for European
Market Flow Indicator	2	X	Defines the type of instruments Refer to Chapter 9, ”Market Feed Indicators”
Group Instrument	2	X	Group of the instrument
Instrument	4	X	Instrument SAIL ID
ISIN	12	X	External ISIN
Instrument External Code	30	X	External identifier used by traders when entering an order
Option Marker	2	A	Refer to paragraph “6.1”
Underlying Symbol Root	10	A	Symbol root for the underlying security
Contract Size	8	X	Defines the quantity of deliverable underlyings in one contract Refer to paragraph “6.4”
Tick Value	7	N	
Tick Value Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”

Note: If both “Maximum Threshold Price” and “Minimum Threshold Price” are set to 0, no thresholds have been configured.

3.2.25 Message Type JF - Futures Instrument Keys - 123 bytes

Field Name	L	T	Definition / Validation Rules
Message Header	11		Refer to paragraph “2.2”
Exchange ID	1	A	Exchange on which the instrument is listed. I: IDEM E: Turquoise O: Oslo Bors
Symbol Root	6	A	Futures series symbol
Delivery Year	2	N	Last two digits of the delivery year of the future
Delivery Month	1	A	Delivery month of the future
Delivery Day	2	N	Delivery day of the future
Corporate Action	1	A	Values are: X, Y, Z,Q,R,S,G,U,V : pending Corporate Action impacting contract Blank : no Corporate Action impacting contract
Expiry Year	2	N	Last two digits of the expiry year of the future
Expiry Month	1	A	Expiry month of the future
Expiry Day	2	N	Expiry day of the future
Maximum Number of Contracts per Order	6	N	Maximum authorized number of contract per order Refer to paragraph “6.4”
Minimum Number of Contracts per Order	6	N	Minimum authorized number of contract per order Refer to paragraph “6.4”
Maximum Threshold Price	7	N	Maximum threshold price authorized for an option contract Refer to paragraph “6.4”
Maximum Threshold Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”
Minimum Threshold Price	7	N	Minimum threshold price authorized for an option contract. Refer to paragraph “6.4”
Minimum Threshold Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”
Tick Increment	7	N	Precision with which the price of an order limit can be expressed Refer to paragraph “5.1”
Tick Increment Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”
Market Flow Indicator	2	X	Defines the type of instruments Refer to Chapter 9, ”Market Feed Indicators”
Group Instrument	2	X	Group of the instrument

Instrument	4	X	Instrument SAIL ID
ISIN	12	X	External ISIN
Instrument External Code	30	X	External identifier used by traders when entering an order
Currency	3	X	Refer to paragraph “6.5”
Underlying Symbol Root	10	X	
Contract Size	8	X	Defines the quantity of deliverable underlyings in one contract Refer to paragraph “6.4”
Tick Value	7	N	
Tick Value Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”

Note: If both “Maximum Threshold Price” and “Minimum Threshold Price” are set to 0, no thresholds have been configured.

3.2.26 Message Type JS- Strategy Instrument Keys - 146 bytes

Field Name	L	T	Definition / Validation Rules
Message Header	11		Refer to paragraph “2.2”
Exchange ID	1	A	Exchange on which the instrument is listed. I: IDEM E: Turquoise O: Oslo Bors
Symbol	30	X	Identification of the strategy The legs (underlying) are defined in message type NS Alphanumeric with "." (when needed)
Expiry Year	2	N	Last two digits of the expiry year of the contract
Expiry Month	1	A	Expiry month for the contract
Expiry Day	2	N	Expiry day of the contract
Maximum Number of Contracts per Order	6	N	Maximum authorized number of contract per order Refer to paragraph “6.4”
Minimum Number of Contracts per Order	6	N	Minimum authorized number of contract per order Refer to paragraph “6.4”

Maximum Threshold Price Sign +/-	1	X	Threshold Price Sign +/- Refer to paragraph “4.2”
Maximum Threshold Price	7	N	Maximum threshold price authorized for an option contract Refer to paragraph “6.4”
Maximum Threshold Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”
Minimum Threshold Price Sign +/-	1	X	Threshold Price Sign +/- Refer to paragraph “4.2”
Minimum Threshold Price	7	N	Minimum threshold price authorized for an option contract. Refer to paragraph “6.4”
Minimum Threshold Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”
Tick Increment	7	N	Precision with which the price of an order limit can be expressed Refer to paragraph “5.1”
Tick increment Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”
Market Flow Indicator	2	X	Defines the type of instruments Refer to Chapter 9, ”Market Feed Indicators”
Group Instrument	2	X	Group of the instrument
Instrument	4	X	Instrument SAIL ID
Instrument External Code	30	X	External identifier used by traders when entering an order
Strategy Allow Implied	1	A	Indicates if the Strategy supports Implied Pricing Y: Yes N: No
Strategy Pricing	1	A	Indicate the pricing method for the strategy. L : Same as legs N : Notional

3.2.27 Message Type L- Bulletins - 93 bytes

Bulletins will be sent throughout the trading day. More than one message will be used if the bulletin is longer than 79 characters. The continuation character "0" indicates that the bulletin continues to the next record.
When a Trading instrument has been halted by the Exchange, a Bulletin Message explaining the reason for the halt will be transmitted. When the trading instrument is reinstated, another Bulletin Message explaining the news that accompanied the reinstatement will be transmitted.
All records that make up a particular bulletin will be sent out together. No other message will be interspersed among the records that make up a complete bulletin.

Field Name	L	T	Definition / Validation Rules
Message Header	11		Refer to paragraph "2.2"
Reserved	1		Reserved for future use
Bulletin Type	1	X	1 = regular text bulletin, refer to section 3.2.24.1, Bulletin Type 1 - Regular Text Bulletin 2 = special text bulletin, refer to section 3.2.24.2, Bulletin Type 2 - Special Text Bulletin

3.2.27.1 Bulletin Type 1 - Regular Text Bulletin

Field Name	L	T	Definition / Validation Rules
Bulletin Contents	79	X	Bulletin in textual form. Left justified, blank fill
Continue Marker	1	N	0 = bulletin continues in next record 1 = bulletin ended

3.2.27.2 Bulletin Type 2 - Special Text Bulletin

This bulletin type will be used for bulletins relating to a specific trading instrument

Field Name	L	T	Definition / Validation Rules
Symbol	30	X	
Bulletin Contents	49	X	Bulletin in textual form. Left justified, blank fill
Continue Marker	1	N	0 = bulletin continues in next record 1 = bulletin ended

Note: *Any continuation records will also contain the symbol as the first 30 bytes of the bulletin field.*

3.2.28 Message Type N - Option Summary - 149 bytes

An option summary message is sent following an option trade cancellation. An option summary message is also sent each day at the start of the day in order to provide a list of options which will be trading each day. At that point, all price fields with the exception of the Closing price (which will have the previous day's Settlement price), and the Open interest will contain zero values.
Any option summary sent after the BEGINNING OF OPTIONS SUMMARY message (with Message Type = Q) contains the list of trading instruments for the day (sent prior to market opening) or the summaries after the close of the market.

Field Name	L	T	Definition / Validation Rules
Message Header	11		Refer to paragraph "2.2"
Exchange ID	1	A	Identifies the exchange for the option I: IDEM E: Turquoise O: Oslo Bors
Symbol Root	6	A	Option base symbol
Expiry Year	2	N	Last two digits of the expiry year of the option
Expiry Month	1	A	Expiry month of the option
Expiry Day	2	N	Expiry day of the option
Call/Put Code	1	A	Values are: C = Call P = Put O = Over U = Under
Strike Price	7	N	Strike price of the option in full. Refer to chapter "5"
Strike Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph "4.3"
Corporate Action	1	A	Values are: X, Y, Z,Q,R,S,G,U,V : pending Corporate Action impacting contract Blank : no Corporate Action impacting contract
Bid Price	7	N	Most recent bid price
Bid Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph "4.3"
Bid Size	5	N	Number of contracts represented by the Bid Price. If size is greater than 99999, the 5th character becomes an exponent Refer to paragraph "6.4"
Ask Price	7	N	Most recent ask price
Ask Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph "4.3"

Ask Size	5	N	Number of contracts represented by the Ask Price. If size is greater than 99999, the 5th character becomes an exponent Refer to paragraph “6.4”
Last Price	7	N	Most recent trade price
Last Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”
Closing Price	7	N	Internal closing price calculated by Sola internal based on the last trade/bid/ask in the book at the time of market closure.
Closing Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”
Settlement Price	7	N	Official CC&G/OSLO Clearing Securing closing prices from the clearing houses which is used to calculate they daily settlements. 0 until market closes
Settlement Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”
Open Interest	7	N	Outstanding number of contracts in the series as of previous day Refer to paragraph “6.4”
Tick	1	X	Determined by the difference between last price and the previous different trade price + = uptick - = downtick
Volume	8	N	Total number of contracts traded or current volume if sent after a cancellation
Net Change Sign +/-	1	X	For net change field
Net Change	7	N	Net change = last trade price - previous settlement Net change will be zero if the option did not trade on the last business day or did not trade today.
Net Change Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”
Open Price	7	N	Price of the first trade of the day
Open Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”
High Price	7	N	Highest trade price of the day or current high price if sent after a cancellation
High Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”
Low Price	7	N	Lowest trade price of the day or current low price if sent after a cancellation

Low Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”
Option Marker	2	A	Refer to paragraph “6.1”
Underlying Symbol Root	10	A	Symbol root for the underlying security
Delivery Year	2	N	Last two digits of the delivery year
Delivery Month	1	A	Delivery month for the contract
Delivery Day	2	N	Delivery day

3.2.29 Message Type NF - Futures Summary - 130 bytes

A Futures summary is sent following a Futures trade cancellation. A Futures summary is also sent each day at the start of the day in order to provide a list of Futures which will be trading each day. At that point, all price fields, with the exception of the previous day Settlement price and the open interest will contain zero values.
Any summary sent after the BEGINNING OF FUTURE SUMMARY message (with Message Type. = QF) contains the list of trading instruments for the day (sent prior to market opening) or the summaries after the close of the market.

Field Name	L	T	Definition / Validation Rules
Message Header	11		Refer to paragraph “2.2”
Exchange ID	1	A	Identifies the exchange for the future I: IDEM E: Turquoise O: Oslo Bors
Symbol Root	6	A	Symbol for the Future Series
Delivery Year	2	N	Last two digits of the delivery year of the future
Delivery Month	1	A	Delivery month of the future
Delivery Day	2	N	Delivery day of the future
Corporate Action	1	A	Values are: X, Y, Z,Q,R,S,G,U,V : pending Corporate Action impacting contract Blank : no Corporate Action impacting contract
Bid Price	7	N	Closing bid or most recent bid if sent after a cancellation
Bid Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”
Bid Size	5	N	Number of contracts represented by the Bid Price If size is greater than 99999, the 5th character becomes an exponent Refer to paragraph “6.4”
Ask Price	7	N	Closing Ask Price or most recent Ask Price if sent after a cancellation
Ask Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”

Ask Size	5	N	Number of contracts represented by the ask price If size is greater than 99999, the 5th character becomes an exponent Refer to paragraph “6.4”
Last Price	7	N	Last trade price for the contract or the current price if sent after a cancellation
Last Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”
Open Price	7	N	Price of the first trade of the day
Open Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”
High Price	7	N	Highest trade price of the day or current high price if sent after a cancellation
High Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”
Low Price	7	N	Lowest trade price of the day or current low price if sent after a cancellation
Low Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”
Closing Price	7	N	Closing price sent at the closing of the market
Closing Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”
Settlement Price	7	N	Official CC&G/OSLO Clearing Securing closing prices from the clearing houses which is used to calculate they daily settlements. 0 until market closes
Settlement Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”
Net Change Sign +/-	1	X	For net change field
Net Change	7	N	Net change = last Trade Price - previous Settlement Price If no previous settlement price (new series) then net change is zero
Net Change Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”
Volume	8	N	Total number of contracts traded Refer to paragraph “6.4”
Previous Settlement	7	N	Settlement Price for the previous day
Previous Settlement Fraction Indicator	1	X	Fraction indicator for the previous Settlement Price
Open Interest	7	N	Outstanding number of contracts in the series as of previous day. Refer to paragraph “6.4”

Underlying Symbol Root	10	X	Symbol root for the underlying security

3.2.30 Message Type NS- Strategy summary-Min 191 bytes/Max 785 bytes

A Strategy summary is sent following a Strategy trade cancellation. A Strategy summary is also sent each day at the start of the day in order to provide a list of Strategies which will be trading each day. At that point, all price fields, with the exception of open interest will contain zero values.
Any Strategy summary sent after the BEGINNING OF STRATEGY SUMMARY message (with message Type. = QS) contains the list of trading instruments for the day (sent prior to market opening) or the summaries after the close of the market.

Field Name	L	T	Definition / Validation Rules
Message Header	11		Refer to paragraph “2.2”
Exchange ID	1	X	Identifies the exchange for the strategy I: IDEM E: Turquoise O: Oslo Bors
Symbol	30	X	Identification of the strategy The legs (underlying) are defined in message type NS
Bid Price sign +/-	1	X	For the Bid Price field
Bid Price	7	N	Closing bid or most recent bid if sent after a cancellation
Bid Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”
Bid Size	5	N	Number of contracts represented by the Bid Price. If size is greater than 99999, the 5th character becomes an exponent Refer to paragraph “6.4”
Ask Price Sign +/-	1	X	For the Ask Price field
Ask Price	7	N	Closing ask or most recent ask if sent after a cancellation
Ask Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”
Ask Size	5	N	Number of contracts represented by the Ask Price. If size is greater than 99999, the 5th character becomes an exponent Refer to paragraph “6.4”
Last Price Sign +/-	1	X	For the Last Price field
Last Price	7	N	Last Trade Price for the contract or the current price if sent after a cancellation
Last Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”

Open Price Sign +/-	1	X	For the Open Price field
Open Price	7	N	Price of the first trade of the day
Open Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”
High Price Sign +/-	1	X	For the High Price field
High Price	7	N	Highest trade price of the day or current high price if sent after a cancellation
High Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”
Low Price Sign +/-	1	X	For the Low Price field
Low Price	7	N	Lowest Trade Price of the day or current low price if sent after a cancellation
Low Price Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”
Net Change Sign +/-	1	X	For net change field
Net Change	7	N	Net change = last trade price - previous close If no previous settlement price (new series) then net change is zero
Net Change Fraction Indicator	1	X	Defines fraction or multiplier positions. Refer to paragraph “4.3”
Volume	8	N	Total number of contracts traded Refer to paragraph “6.4”
Number of Legs	2	N	Number of legs in the strategy 2 to 20
Ratio Sign	1	X	Identification of the transaction in the strategy (buy or sell of the underlying) + : Buy of the underlying - : Sell of the underlying
Ratio	2	N	Quantity (bought or sold) on underlying in the strategy. 1 to 20
Leg Symbol	30	X	Identification of the leg

3.2.31 Message Type Q - Beginning of Options Summary - 12 bytes

This message indicates that the beginning and the end of day option summaries (message type N) are to follow. Other messages (such as bulletins) can be interspersed with the summaries.

Field Name	L	T	Definition / Validation Rules
Message Header	11		Refer to paragraph “2.2”

Exchange ID	1	A	Identifies the exchange I: IDEM E: Turquoise O: Oslo Bors

3.2.32 Message Type QB -Beginning of Futures Options Summary-12 bytes

This message indicates that the beginning and the end of day Future Options summaries (message type NB) are to follow. Other messages (such as bulletins) can be interspersed with the summaries.

Field Name	L	T	Definition / Validation Rules
Message Header	11		Refer to paragraph "2.2"
Exchange ID	1	A	Identifies the exchange I: IDEM E: Turquoise O: Oslo Bors

3.2.33 Message Type QF - Beginning of Futures Summary - 12 bytes

This message Indicates that the beginning or the end of day Futures summaries (message type NF) are to follow. Other messages can be interspersed with the summaries.

Field Name	L	T	Definition / Validation Rules
Message Header	11		Refer to paragraph "2.2"
Exchange ID	1	A	Identifies the exchange I: IDEM E: Turquoise O: Oslo Bors

3.2.34 Message Type QS - Beginning of Strategy Summary - 12 bytes

This message indicates that the beginning or the end of day Strategy summaries (message type NS) are to follow. Other messages can be interspersed with the summaries.

Field Name	L	T	Definition / Validation Rules
Message Header	11		Refer to paragraph "2.2"
Exchange ID	1	A	Identifies the exchange I: IDEM E: Turquoise O: Oslo Bors

3.2.35 Message Type RS – Connection Message – Min 32/ Max .6062 bytes

Field Name	L	T	Definition / Validation Rules
Message Header	11	X	Refer to paragraph "2.2"
Reset Sequence	10	N	Indicates the last message received. Messages will restart at '0000000001' every day.
Equity Options	1	A	Client wants to receive all regular market messages on the Options market. Y: Yes N: No
Futures	1	A	Client wants to receive all regular market messages on the Futures market. Y: Yes N: No
Market Depth	1	A	Client wants to receive: Y: Market Depth messages (type H*) on the top 5 Bids/ Asks for the type of trading instruments chosen I: Market Depth messages (type H*) on the top 5 Bids/Asks and the calculated implied best limit N: The best Bid/Ask message (type F*) for the type of trading instrument chosen T: Trade messages (type C*) without Quotes or Market Depth messages
Strategies	1	A	Client wants to receive: Y: Regular market messages, and all the Strategies on the different trading instruments N: Only regular market messages
Market Summaries	1	A	Y: Client wants to receive ONLY the market summaries and the Instrument key messages N: Client wants to receive the regular market messages with the summaries and the Instrument key messages
GAP Control	1	N	Client will receive GAP messages: 0: Yes 1: No *Note: The sequence number will not be in an n+1 order.*
HSVF Protocol Version	2	X	Value supported: E4: LSE SOLA version E4. Only protocol supported.
Number of Classes Requested	3	N	000: Client wants to receive messages on all classes. 001 to 999: Client wants to receive messages on indicated number of classes.
Classes Requested	Up to 5994 bytes	X	Class requested (using the 6 character symbol root, right padded with blanks). Maximum: 999 classes Ex : to request for classes ABC and DEF: ABC<blank><blank><blank>DEF<blank><blank><blank>

3.2.36 Message Type S - End of sales - 18 bytes

The "End of Sales" message will be sent when there is no more trading activity to be transmitted. This will occur after the closing of the market.

Field Name	L	T	Definition / Validation Rules
Message Header	11		Refer to paragraph "2.2"
Reserved	1		Reserved for future use
Time	6	N	Time at which the message is transmitted HHMMSS

3.2.37 Message Type U- End of transmission - 18 bytes

This message will be sent to indicate that the day's transmission is complete. After this, no HSVF messages will be transmitted. Transmission will resume the following day.

Field Name	L	T	Definition / Validation Rules
Message Header	11		Refer to paragraph "2.2"
Exchange ID	1	A	I: IDEM E: Turquoise O: Oslo Bors
Time	6	N	Time at which the message is transmitted HHMMSS

3.2.38 Message Type V- Circuit Assurance - 17 bytes

This message is sent if no messages are sent for more than one minute once the broadcast has started (i.e. at the termination of the Test Loop message). This will be an assurance that the line is up. This message will continue to be sent until the End of Transmission message (type U) is sent. The Circuit Assurance message will repeat the sequence number of the previous record transmitted (except if it is a re-transmit message) i.e. it will not augment the sequence number.

Field Name	L	T	Definition / Validation Rules
Message Header	11		Refer to paragraph "2.2"
Time	6	N	Time at which the message is transmitted HHMMSS

3.2.39 Message Type W - Gap sequence - 20 bytes

Field Name	L	T	Definition / Validation Rules
Message Header	11		Refer to paragraph "2.2" *Note: Sequence Number for the 'W' message is the same as the Sequence Number for the first skipped message of a Class different from the Class requested.*

Sequence Numbers Skipped	9	N	Sequence numbers skipped. *Note: This value must be equal to the Sequence Number of the last skipped message of a Class different from the Class requested.*

The Gap message signals the beginning and ending sequence numbers of messages relating to classes different from those subscribed to by the client during the connection message.
The example outlined in the following table indicates the messages to be received by a client who has subscribed to receive market data on Class 'YYY', along with Gap messages.
The table data under Message Log lists a number of message types showing; Sequence Number, Message Type, Exchange ID, and Symbol Root. Based on what the client has sub- scribed to in the Connection Message (RS), the messages to be received are listed under the Client Received Messages section of the table. Refer to Message Type RS - Connection Message - Min. 32 / Max. 6026 bytes for details on subscription options.

Message Log				Client Received Messages				
SeqNo	Msg Type	Exchange ID	Symbol Root	SeqNo	Msg Type	Exchange ID	Symbol Root	Skipped SeqNo
000007393	C	Q	YYY	00000 7393	C	E	YYY	n/a
000007394	H	Q	ZZZ					
000007395	C	Q	XXX					
000007396	C	Q	ZZZ					
000007397	H	Q	FFF	00000 7394	W	n/a	n/a	000007397
000007398	N	Q	YYY	00000 7398	N	E	YYY	n/a
000007399	H	Q	ZZZ					

4 Price Fields

4.1 Description

The Price field will be a seven (7) character numeric field. The delineation of the whole number portion of the price and the decimal/fractional portion of the price will be defined by the Fraction Indicator Code (FI). Furthermore, the FI will indicate the manner in which the price is to be displayed visually. This implies that all zero fractions may be sent in order to maintain consistency in the visual alignment of the implied decimal places. The all zero fraction would be replaced by spaces for visual display.
No truncation of price data is permitted by this specification except for high order zeros for products which trade in fractions of 1/100,000,000 or smaller. Should such truncation be necessary then it will be implicit from the FI which will be 8, or 9.

4.2 Price Sign

The Price Sign of length one (1) indicates if the Price is positive (+) or negative (-).

4.3 Fraction/Multiplier indicator code

Fraction Indicator Code will be one (1) Alphanumeric Character as follows:

Fraction	Code	Multiplier	Code
1/1	0		
1/10	1	10	L
1/100	2	100	M
1/1,000	3	1,000	N
1/10,000	4	10,000	O
1/100,000	5	100,000	P
1/1,000,000	6	1,000,000	Q
1/10,000,000	7		
1/100,000,000	8		
1/1,000,000,000	9		

5 Tick Tables

5.1 TQ Tick Increment Tables

The first Character in the tick table always stands for the Country Code (irrespective of it being an TQ or OB product) as follows:

U = Russia (USD)
N = Norway
G = Great Britain
T = FTSE

The second character is “O” for Index Options and “o” for Stock Options. The character “F” is for Index Futures and “f” is for stock futures.

5.1.1 UK instrument tick tables

5.1.1.1 Go (UK stock options)

Price		Tick Increment
From	To	
0	0.25	0.0100
0.25	4.00	0.0500
4.00	50.00	0.1000
50.00	+	0.2500

5.1.1.2 Gf (UK stock futures)

Price		Tick Increment
From	To	
0	+	0.0100

5.1.2.3 T1 (UK Index Future)

Price		Tick Increment
From	To	
0	+	0.5000

5.1.2.4 T2 (UK Index Option)

Price		Tick Increment
From	To	
0	+	0.5000

5.1.2 Norwegian instrument tick tables

5.1.2.1 NR (NIBOR Bonds)

Price		Tick Increment
From	To	
0	+	0.0050

5.1.2.2 NB (Norwegian binary options)

Price		Tick Increment
From	To	
0	+	0.0100

5.1.2.3 NF (Norwegian index futures)

Price		Tick Increment
From	To	
0	1000.00	0.1000
1000.00	+	0.2500

5.1.2.4 NO (Norwegian index options)

Price		Tick Increment
From	To	
0	0.10	0.0100
0.10	4.00	0.0500
4.00	8.00	0.1000
8.00	+	0.2500

5.1.2.5 Nf (Norwegian stock futures)

Price		Tick Increment
From	To	
0	10.00	0.0100
10.00	50.00	0.0500
50.00	150.00	0.1000
150.00	1000.00	0.2500
1000.00	+	0.5000

5.1.2.6 No (Norwegian stock options)

Price		Tick Increment
From	To	
0	0.10	0.0100

0.10	4.00	0.0500
4.00	8.00	0.1000
8.00	+	0.2500

5.1.3 Russian and IOB instrument tick tables

5.1.3.1 UF (Russian index futures)

Price		Tick Increment
From	To	
0	+	0.2500

5.1.3.2 UO (Russian index options)

Price		Tick Increment
From	To	
0	0.25	0.0100
0.25	4.00	0.0500
4.00	10.00	0.1000
10.00	+	0.2500

5.1.3.3 Uf (Russian and IOB stock futures)

Price		Tick Increment
From	To	
0	+	0.1000

5.1.3.4 Uo (Russian and IOB stock options)

Price		Tick Increment
From	To	
0	0.25	0.0100
0.25	4.00	0.0500
4.00	10.00	0.1000
10.00	+	0.2500

5.1.3.5 Ud (Russian Stock Dividend Futures)

Price		Tick Increment
From	To	
0	1.00	0.0005
1.00	5.00	0.0010
5.00	+	0.0100

5.2 IDEM Tick Increment Tables

The naming convention on IDEM is as follows:

Short Name	Name
AG	AGREX Future
DV	IDEM FTSE MIB DIV INDEX FUTURE
EF	IDEM Stock Future
EO	IDEM Stock Option
IF	IDEM FTSE MIB Future
IO	IDEM FTSE MIB Option
IW	IDEM FTSE MIB Weekly
MF	FTSE100 MINI Future
XF	IDEX Future

5.2.1 AG (AGREX Future)

Price		Tick Increment
From	To	
0	+	0.2500

5.2.2 DV (IDEM FTSE MIB DIV Index Future)

Price		Tick Increment
From	To	
1.00	+	1.0000

5.2.3 EF (IDEM Stock Future)

Price		Tick Increment
From	To	
0	+	0.0001

5.2.4 EO (IDEM Stock Option)

Price		Tick Increment
From	To	
0	+	0.0005

5.2.5 IF (IDEM FTSE MIB Future)

Price		Tick Increment
From	To	
5.00	+	5.0000

5.2.6 IO (IDEM FTSE MIB Option)

Price		Tick Increment
From	To	
1.00	100.00	1.0000
100.00	500.00	2.0000
500.00	+	5.0000

5.2.7 IW (IDEM FTSE MIB Weekly)

Price		Tick Increment
From	To	
1.00	+	1.0000

5.2.8 MF (FTSE100 MINI Future)

Price		Tick Increment
From	To	
0	+	0.5000

5.2.9 XF (IDEX Future)

Price		Tick Increment
From	To	
0	+	0.0100

6 Marker Codes

6.1 Markers for Options

First letter (Currency or type of market)	
Marker	**Description**
B	Trading in British Pound
C	Trading in Canadian Dollar
F	Trading in Swiss Franc
E	Trading in Euro
U	Trading in US Dollar
Y	Trading in Japanese Yen
S	Trading in Swedish Krona
N	Trading in Norwegian Krone
D	Trading in Danish Krone
X	Trading in British Pence
A	Trading in Australian Dollar
L	Trading in Brazilian Real
R	Trading in Chinese Yuan Renmni
K	Trading in Czech Krone
H	Trading in Hong Kong Dollar
O	Trading in Hungarian Forint
I	Trading in Indian Rupee
M	Trading in Malaysian Ringgit
Z	Trading in Polish Zlotty
V	Trading in New Romanian Leu
P	Trading in Russian Ruble
G	Trading in Singapore Dollar
T	Trading in New Turkish Lira
J	Trading in South African Rand
2nd letter (Type of options)	
Marker	**Description**
Blank	Regular Options (Plain vanilla)
B	Binary Options

6.2 Market Status Markers

Status		Used in	
Marker	Description	Group Messages	Instrument Messages
Y	Pre-opening phase	X	X
E	Intervention before Opening Phase	X	X
O	Opening phase	X	X
T	Opened for Trading	X	X
F	Forbidden phase	X	X
H	Trading Halted	X	X
R	Reserved phase (goes into a state as pre-opening where orders can be sent, modified, or cancelled)		X
S	Instrument Suspended		X
A	Surveillance Intervention phase (Consultation phase)	X	X
C	End-of-Day Inquiries phase	X	X
BLANK	If not used		

6.2.1 Opening Phase

This period is the actual un-crossing period (which usually lasts less than 1 second) when potentially tradable orders that were crossing in the pre-auction phase are actually matched and traded at the completion of the auction phase. This phase is called a **group** type phase where all options or all futures sharing the same underlying change status at the same time.

6.2.2 Forbidden Phase

This is a rarely transmitted market phase that and only be forcibly transmitted by Market Operations to stop all trading activity immediately on the Exchange. This phase is called a **group** type phase where all options or all futures sharing the same underlying change status at the same time.

6.2.3 Surveillance Intervention:

This is a global standard phase that occurs for all groups in production that signals cessation of trading for the current business day. Essentially the markets are closed, but participants can still cancel orders from the book, and Market Operations can still Book exchange Granted trades as they close out the books for the day. This phase is called a **group** type phase where all options or all futures sharing the same underlying change status at the same time.

6.2.4 End-of-day Inquiries

This is a global standard phase that occurs for all groups in production that signals cessation of all market activities for the current business day. No new trades, trade cancellations, or closing price

updates will be transmitted after this phase. This phase is called a **group** type phase where all options or all futures sharing the same underlying change status at the same time.

6.3 Price Indicator Markers

Marker	Description
P	Strategy reporting
L	Late trade
A	As-of-trade
I	Implied trade
1	Exchange granted 1 (TG1)
2	Exchange granted 2 (TG2)
BLANK	Actual transaction took place
B	Block Trade
K	Commited Block
T	Commited
C	Crossed

6.4 Indicator code

This code is used for Bid/Ask Size, Volume, and Open Interest. When the number is higher than the maximum number possible to represent with the field length, the last character becomes an exponent.

Marker	Description (the size of the bid/ask field)	
C	100	(Hundreds)
D	1,000	(Thousands)
E	10,000	(Ten-Thousands)
F	100,000	(Hundred-Thousands)
G	1,000,000	(Millions)
H	10,000,000	(Ten-Millions)
I	100,000,000	(Hundred-Millions)
J	1,000,000,000	(Billions)

Data	Message sent	Participant Display
Bid size of 124 872	Size field will indicate '1248C'	124 800
Volume of 8,457,188	Volume will indicate '8457188'	8,457,188
Volume of 258,487,797	Volume will indicate '2584877C'	258,487,700
Open Interest of 544,871	Size field will indicate '544871'	544871
Open Interest of 17,458,795	Size field will indicate '174587C'	17,458,700

6.5 Currency code

Marker	Description
USD	US $
CAD	Canadian $
GBP	Pound Sterling
GBX	Penny Sterling
CHF	Swiss Franc
EUR	Euro
JPY	Yen
SEK	Swedish Krona
NOK	Norwegian Krone
DKK	Danish Krone
AUD	Australian Dollar
BRL	Brazilian Real
CNY	Chinese Yuan Renminbi
CZK	Czech Krone
HKD	Hong Kong Dollar
HUF	Hungarian Forint
INR	Indian Rupee
MYR	Malaysian Ringgit
PLN	Polish Zloty
RON	New Romanian Leu
RUB	Russian Ruble
SGD	Singapore Dollar
TRY	New Turkish Lira
ZAR	South African Rand
Blank	Not provided

7 Strategies

7.1 Strategy Trade Definition

A Strategy Trade is a message notification of a transaction on a strategy (which are 2 instruments being involved in the 1 trade). The current established exchange strategy trade types are the following:

Strategy Type	Market	Format	Example
Future time spread	Turquoise	(CLASS SYMBOL)+(YEAR CLOSEST EXPIRY LEG)(MONTH CODE CLOSEST EXPIRY LEG)-(YEAR FURTHEST EXPIRY LEG)(MONTH CODE FURTHEST EXPIRY LEG)	FFI100+1M-1U
Future time spread	Oslo	(CLASS SYMBOL)+(YEAR FURTHEST EXPIRY LEG)(MONTH CODE FURTHEST EXPIRY LEG)-(YEAR CLOSEST EXPIRY LEG)(MONTH CODE CLOSEST EXPIRY LEG)	OBX+1F-1E
Future time spread	IDEM	(CLASS SYMBOL)(YEAR FURTHEST EXPIRY LEG)(MONTH CODE FURTHEST EXPIRY LEG)T	FIB2LT
Flexible combinations and all other strategies with same Contract Size and Tick Value	All	(CLASS SYMBOL)_FC_(GROUP ID)(SAIL ID)	OGZD_FC_e5E210

7.2 Strategy Quote Definition

A Strategy Quote is the first limit of the market depth message diffused from the Exchange routing engine for a strategy Instrument. It has the current established Best Bid/Best Ask, and Best Bid Volume/ Best Ask Volume (**not** including **hidden** volumes). It is a simple snapshot of what the market conditions are on the Instrument. The same types of strategy rules written above apply in the same manner for the strategy.

7.3 How to Process Strategies

7.3.1 Messages to Use

- JS (Strategy Instrument Keys)
- J/JF (Leg Instrument key messages for options, and futures)
- NS (Strategy Summary Messages)

7.3.2 Process

1. Collect all JS Messages broadcasted in the HSVF and maintain all of their Symbols for future linking to the Symbols in the NS message which will be disseminated after the HSVF JS message. Note JS messages can be broadcasted in HSVF at anytime during the normal trading day for newly created User Requested Flexible Combinations.

2. For each J/JF message record, create and maintain a table of Leg "Symbol – HSVF External Code" couplings.

3. For each leg received in each NS messages:

    - Find the HSVF External Code which is now coupled to the leg Symbol created in step 1

    - Generate the leg description by joining the:

        - Leg Ratio Sign
        - Leg Ratio Integer
        - Leg HSVF External Code

    - Remove all the insignificant "0" and spaces

4. Generate the strategy description by joining the legs description in their respective order in the NS message and you remove all the insignificant spaces.

8 Series Designation

8.1 Options Series Designation

Options series is designated by the symbol for the underlying stock or index as well as by giving certain codes for the expiration year, exercise price, expiration month and the type of option.

Assume a standardised options contract with the following series designation OGZD2C12. What underlying stock the option is related to is designated by the company symbol, for example OGZD for Gazprom. The expiration year is designated by the last number of the year the option expires, for example the figure 2 stands for year 2012. The month the contract expires, whether the contract is a call option or a put option, is shown by a letter code which goes from A to L for call options and from M to X for put options, as shown below:

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Call options	A	B	C	D	E	F	G	H	I	J	K	L
Put options	M	N	O	P	Q	R	S	T	U	V	W	X

In the event of a share split, new issue of shares or similar events that imply a change in the strike price and/or the number of underlying stocks this is shown by the letter X, Y, Z,Q,R,S,G,U or V in the end of the series designation.

8.2 Futures Series Designation

Futures and forward series are designated by the symbol for the underlying stock or index as well as by giving certain codes for the expiration year and month.

Assume a standardised futures contract with series designation RIOB2C. What underlying instrument the future is related to, is designated by the instrument symbol, in this case the RIOB index. The expiration year is designated by the last number of the year the futures expires, for example the figure 2 stands for year 2012. The month the contract expires, whether it is a stock future or an index future, is shown by a letter code which goes from A to L for index futures and from M to X for stock forwards and futures, as shown below. In our example, the letter C shows that the contract is an index future with expiry in March.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Index futures	A	B	C	D	E	F	G	H	I	J	K	L
Stock futures/forwards	M	N	O	P	Q	R	S	T	U	V	W	X
FTSE 100 Index Futures	F	G	H	J	K	M	N	Q	U	V	X	Z

In the event of a share split, new issue of shares, or similar event that imply a change in the price of the stock forward, and/or the number of underlying stocks, this is shown by the letter X, Y, Z,Q,R,S,G,U or V in the end of the series designation.

9 Market Feed Indicators

The following table lists the Market Feed indicators:

First letter	Type of Instrument	Second Letter	Type of Underlying
F	Futures	U	Rate
P	Options on Futures	X	Index
O	Options	E	Equities
U	Strategies on Options on Futures	L	Long term
V	Strategies on Futures		
W	Strategies on Options		