XDP ORDER IMBALANCES FEED CLIENT SPECIFICATION

NYSE AND NYSE MKT

Version	Date
2.0c	October 5, 2016

PREFACE

DOCUMENT HISTORY

VERSION NO.	DATE	CHANGE DESCRIPTION
2.0	June 16, 2016	Version 2.0 Initial Publicaton
2.0a	July 28, 2016	Updated description of the AuctionType field in Imbalance Message 105
2.0b	August 16, 2016	Updated control message types and message publication times in Section1
2.0c	October 6, 2016	Updated section 2.3: From 9:20 to stock open, Imbalances are published every 5 seconds

REFERENCE MATERIAL

The following lists the associated documents, which either should be read in conjunction with this document or which provide other relevant information for the user:

- XDP Common Client Specification
- SFTI US Technical Specification
- SFTI US Customer Guide
- NYSE Symbology

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FURTHER INFORMATION

For additional information about the product, visit the XDP Integrated Feed Product Page

For updated capacity figures, visit our capacity pages at: http://www.nyxdata.com/capacity

For details of IP addresses, visit our IP address pages at: http://www.nyxdata.com/ipaddresses

For a full glossary, visit: http://www.nyxdata.com/glossary/

CONTENTS

1. XDP Order Imbalances Feed Information

1.1 OVERVIEW

This real-time low latency product provides imbalance data published during auctions of all traded securities on the NYSE and NYSE MKT exchange. This data is intended for clients who require a direct standalone feed with timestamps provided directly from the Exchange matching engines.

1.2 PRODUCT ID

EXCHANGE	PRODUCT ID	DESCRIPTION
NYSE	8	NYSE Order Imbalances Feed
NYSE MKT	58	NYSE MKT Order Imbalances Feed

1.3 MESSAGE TYPES USED IN THE FEED

See the XDP Common Client Specification for details on all control messages.

MSG TYPE	DESCRIPTION	PUBLISHER CHANNELS	REQUEST CHANNEL	REFRESH CHANNELS
105	Imbalance Message	x		x

1.4 CONTROL MESSAGE TYPES USED IN THE FEED

See the XDP Common Client Specification for details on all control messages.

MSG TYPE	DESCRIPTION	PUBLISHER CHANNELS	REQUEST CHANNEL	REFRESH CHANNELS
1	Sequence Number Reset	x		x
3	Symbol Index Mapping	x		x
10	Retransmission Request		client	
11	Request Response		server	
12	Heartbeat Response		client	
13	Symbol Index Mapping Request		client	
15	Refresh Request		client	
31	Message Unavailable		server	
32	Symbol Clear	x		
34	Security Status Message	x		x
35	Refresh Header Message			x

**Used in the Arca market only.*

1.5 MESSAGE PUBLICATION TIMES

All times apply to NYSE and NYSE MKT, and are US Eastern Standard Time.

Integrated Feed Message Types

MSG TYPE	DESCRIPTION	NORMAL DAYS	EARLY CLOSE DAYS
105	Imbalance Message	**See Section A.1.2**	**See Section A.1.2**

Control Message Types

See the XDP Common Client Specification for details on all control messages.

MSG TYPE	DESCRIPTION	NORMAL DAYS	EARLY CLOSE DAYS
1	Sequence Number Reset	12:30am – 4:00pm	12:30am – 1:00pm
3	Symbol Index Mapping	12:30am – 4:00pm	12:30am – 1:00pm
32	Symbol Clear	12:30am – 4:00pm	12:30am – 1:00pm
34	Security Status Message	7:30am – 4:00pm	7:30am – 1:00pm

2. Imbalance Message– Msg Type 105

Imbalance messages are sent periodically to update price and volume information during auctions.

See section **3** for details on the auction process in the NYSE markets.

See the XDP Common Client Specification for details on Symbol Index Mapping messages and Price field format.

FIELD NAME	OFFSET	SIZE (BYTES)	FORMAT	DESCRIPTION
Msg Size	0	2	Binary	Size of the message: 52 bytes
Msg Type	2	2	Binary	The type of message: 105 – Imbalance Message
SourceTime	4	4	Binary	The time when this msg was generated in the order book, in seconds since Jan 1, 1970 00:00:00 UTC.
SourceTimeNS	8	4	Binary	The nanosecond offset from the Source Time
SymbolIndex	12	4	Binary	The ID of the symbol in the Symbol Index msg
SymbolSeqNum	16	4	Binary	The sequence number of this message in the set of all messages for this symbol
ReferencePrice	20	4	Binary	The Reference Price is the Last Sale if the last sale is at or between the current best quote. Otherwise the Reference Price is the Bid Price if last sale is lower than Bid price, or the Offer price if last sale is higher than Offer price. (see Appendix A for details)
PairedQty	24	4	Binary	The number of shares paired off at the reference price point truncated to the round lot. E.g. 1575 shares is published as 1500.
TotalImbalanceQty	28	4	Binary	The total imbalance quantity at the reference price truncated to the round lot. E.g. 1575 shares is published as 1500.
MarketImbalanceQty	32	4	Binary	Unused in NYSE and NYSE MKT, defaulted to 0.
AuctionTime	36	2	Binary	Projected Auction Time (hhmm)
AuctionType	38	1	ASCII	The reason for the auction. Valid values: ▪ ‘M’ – Opening Auction ▪ ‘H’ – Reopening Auction (Halt Resume) ▪ ‘C’ – Closing Auction ▪ ‘R’ – Regulatory Imbalance
ImbalanceSide	39	1	ASCII	The side of the imbalance. Valid Values:

FIELD NAME	OFFSET	SIZE (BYTES)	FORMAT	DESCRIPTION
				▪ 'B' – Buy ▪ 'S' – Sell ▪ Space – No imbalance
ContinuousBook ClearingPrice	40	4	Binary	The indicative matching price, i.e. the price closest to the reference price where the imbalance is 0. If a continuous book clearing price is not reached, it is defaulted to 0.
ClosingOnly ClearingPrice	44	4	Binary	The price closest to the reference price where the imbalance of closing only interest is 0. If a closing only clearing price is not reached, it is defaulted to 0.
SSRFilingPrice	48	4	Binary	The price at which Sell Short interest in the opening auction will be filed if a Sell Short Restriction is in effect for the security.

3. Information on Auctions

3.1 NYSE AND NYSE MKT AUCTIONS

<table>
<tr><th>MESSAGE TYPE</th><th>DESCRIPTION</th></tr>
<tr><td>Opening</td><td>Interest Included
All electronic interest eligible to trade in the opening auction
DMM interest as needed to offset the imbalance
Order Cancellation
Orders can be cancelled at any time up to the conclusion of the auction
Calculation
The Reference Price is equal to the previous close unless there is a Rule 15 or Mandatory indication published, in which case
The Reference Price is the indication low price if the indication low price is higher than the previous close
The Reference Price is the indication high price if the indication high price is lower than the previous close
The Reference Price is the previous close if the previous close is within the indication range
The Continuous Book Clearing Price is defaulted to 0 until 2 minutes before the opening auction time.</td></tr>
<tr><td>Closing</td><td>Interest Included
For Paired Quantity, Total Imbalance Quantity and Closing Only Clearing Price:
MOC and LOC orders
Closing Only interest (when offsetting the imbalance)
Discretionary orders in the last 5 minutes of the auction only
For Continuous Book Clearing Price:
All electronic interest eligible to trade in the closing auction
DMM interest as needed to offset the imbalance
Order Cancellation
Orders can be cancelled any time during the auction, except for MOC and LOC orders which can be cancelled only up to 2 minute before the conclusion of the auction.
Calculation
The Continuous Book Clearing Price is defaulted to 0 until 15 minutes before the closing auction time.</td></tr>
</table>

3.2 NYSE AND NYSE MKT PUBLICATION TIMES

If there is no change to the calculated fields, no message will be generated.

MESSAGE	PUBLICATION PERIOD	PUBLICATION FREQUENCY
NYSE Opening Imbalances	60 minutes before market open until 30 minutes before market open	Every 5 minutes
	30 minutes before market open until 10 minutes before market open	Every 1 minute
	10 minutes before market open until 5 minutes after market open or until the stock opens	Every 5 seconds
NYSE Closing Imbalances	15 minutes before market close until market close	Every 5 seconds