CME Group

A CME/Chicago Board of Trade Company

Market Data Platform FIX/FAST

FIX Message Specifications: Historical Data

Version: 1.3

Latest Release: 11/3/09

Contents

Overview

DataMine Market Depth provides historical data in FIX format. The following data types are available:

- **Market Depth (Top 5) Data** – Provides all of the CME Group Market Data messages needed to recreate the book (multiple-depth) and trade data for any CME Globex traded product, including CME, CBOT, COMEX, and NYMEX products, time-stamped to the centi-second.

For complete information on services offered with DataMine Market Depth, refer to:
http://www.cmegroup.com/market-data/datamine-historical-data/overview.html

This document contains the message specification and development considerations specific to DataMine Market Depth and should only be used for historical data purposes. For real-time Market Data Platform message specifications and implementation considerations, refer to
http://www.cmegroup.com/cmegroup/globex/resources/fix-fast-market-data-format.html

For additional information, please contact 1-800-331-3332.

DataMine Market Depth Data Structure

DataMine Market Depth files are available as text (.txt) files and contained in applicable zip (.zip) files. The text file(s) are comprised of the raw FIX messages sent over CME Globex Market Data Platform for a specified Exchange Code, Group Code, Product Code, Instrument Type, and Date. Depending on the amount of requested data, one or more text files may contain the requested data.

File Processing

Text files (.txt) are zipped (.zip) according to size and labeled as follows:
ExchangeCode_GroupCode_ProductCode_InstrumentType_Date.zip

ExchangeCode	exchange code
GroupCode	group code
ProductCode	product code

InstrumentType	instrument type, abbreviated as:
	FUT = futures
	OPT = options
	FUT_SPD = futures spread
	OPT_SPD = options spread
	MIX_SPD = mixed spread

Date	trade date in yyyymmdd format

The .txt files inside the .zip file should be extracted and processed in a specific order, with the **highest-suffixed number .txt file always processed first,** then processing all remaining .txt files in **descending** numerical order.

File Processing Example

1. Customer requests data for the following: CME exchange code, EJ group code, EJ product code, Futures, 08 October 2009.
2. The following file is sent to the customer: XCME_EJ_EJ_FUT_20091008.zip
3. Within the zip file, there are several text files that may appear to be sorted in an ascending order:

XCME_EJ_EJ_FUT_20091008.zip	XCME_EJ_EJ_FUT_20091008.txt XCME_EJ_EJ_FUT_20091008.txt.001 XCME_EJ_EJ_FUT_20091008.txt.002

4. Regardless of the sorted view, the customer extracts all text files and processes the text files in the following **descending** order:
   XCME_EJ_EJ_FUT_20091008.txt.002
   XCME_EJ_EJ_FUT_20091008.txt.001
   XCME_EJ_EJ_FUT_20091008.txt

Reading DataMine Market Depth Data

DataMine Market Depth text file(s) are composed of the raw FIX messages that were sent over CME Globex Market Data Platform. FIX is used as the message format and lends itself well to the strategy of incremental messaging.

An incremental approach to market data sends only the data necessary to convey the impact of a market event and is intended to significantly reduce data content. Rather than repainting the book with a single message, a minimum number of instructions are used to update the book. Add, change, delete, and overlay instructions are used to convey the action to be applied. Incremental messaging can be similar to an order-based feed in that each instruction corresponds to order activity, the primary difference being aggregation at a price level.

In each text file, there is a string of raw FIX messages with standard FIX delimiters between tags. To read the tags and values, refer to the FIX Message Specification.

Due to the nature of incremental messaging, the FIX messages must be processed in order. Customers should process data beginning with the first line of the first text file, and continuing to read all lines in order until all lines of text are processed in that text file. If subsequent text files are available, they should be processed in the same manner. In addition, customers who begin processing data mid-week should refer to the Market Data Platform FIX/FAST – Core Functionality – Natural Refresh section. Refer to DataMine Market Depth Data Structure for complete information on the order to process text files.

FIX Messaging

All messages in the text file are the Market Data Incremental Refresh tag 35-MsgType=X message. All DataMine Market Depth data types are distributed using the Market Data Incremental Refresh tag 35-MsgType=X message, including book data, time and sales data, and end of day data. Tag 279-MDUpdateAction and tag 269-MDEntryType should be leveraged to determine the type of data in the message. Refer to the FIX Message Specification for additional information.

The FIX Market Data Incremental Refresh tag 35-MsgType=X message has a FIX header followed by a number of data blocks. Each data block represents a single instruction such as a book update or statistic.

Security Description

Market Data Incremental Refresh tag 35-MsgType=X messages in DataMine Market Depth contain tag 107-SecurityDesc on every message. Tag 107-SecurityDesc provides the security description for an instrument. This behavior is different than MDP FIX/FAST processing where tag 107-SecurityDesc is *not* sent in the Market Data Incremental Refresh tag 35-MsgType=X message.

Sequence Numbers

Market Data Incremental Refresh tag 35-MsgType=X messages contain instrument sequence numbers (tag 83- RptSeq), in addition to message sequence numbers (tag 34-MsgSeqNum). These sequence numbers are the same sequence numbers that sent over CME Globex Market Data Platform.

The FIX message sequence number, tag 34-MsgSeqNum, is an incrementing number. If a gap is detected between messages in tag 34-MsgSeqNum, this indicates a message has not been processed in the correct order.

34	MsgSeqNum	SeqNum (9)	Integer message sequence number.

Every repeating group instance of a market data entry contains an incrementing sequence number (tag 83-RptSeq) that is associated with the instrument for which data is present in the block. Tag 34-MsgSeqNum and tag 83-RptSeq should be tracked and used to verify that messages in the text file are processed in the correct order.

83	RptSeq	Int (1)	Sequence number per Instrument update.

Book Management and Statistics

The Market Data Incremental Refresh (tag 35-MsgType = X) message is used to apply instructions to a book. **These instructions are incremental and update applicable parts of the book as necessary, as opposed to refreshing the entire book each time there is an update.** This message is used to maintain the aggregate order book for CME Group products. This message, on a real-time basis, is also used to send statistics.

Note: Multiple data blocks may be sent in the same message. To determine the number of data blocks you will receive in the message, refer to tag 268-NoMDEntries. Within the message, data blocks may be for different instruments or entry types (book update, statistics, or trades).

Note: Data blocks for different instruments may be sent in the same message. The instruments will however be filtered based on the Group Code / Product Code combination as indicated in the DataMine Market Depth text file.

Refer to ***http://www.cmegroup.com/globex/files/SDKFFCore.pdf*** – Section 5. Incremental Book Management and Section 6. Real Time Statistics (Market Behavior Events) for additional information.

Book Management

- CME Group provides a multiple-depth book for several products.
- CME Group provides a 2-deep best bid and ask in the market for each implied prices futures contract. **Implied book updates are denoted by the presence of tag 276-QuoteCondition = K (Implied).**
- CME Group provides the current best bid and ask (top-of-book) in the market for certain instruments (tag 276-QuoteCondition = C – Exchange Best).
- CME Group provides the current best resolved bid and ask theoretical book (top of book only) from a group of market makers for indicative prices. Indicative **book updates are denoted by the presence of 1070-MDQuoteType = 0 (Indicative).**

Statistics

There are a number of statistics (market data events) which are related to changes in a book but are not used to update the book. The following artifacts fit this category: last best price, trade, high/low trade price, best high bid, and best low ask, price, and pre-opening statistics. These events describe the behavior of the market and allow a user to know when the market is moving in a certain direction and provide historical information on how the market has performed.

Reference Data Blocks

Refer to ***http://www.cmegroup.com/globex/files/SDKFFMessageSpecs.pdf*** - Appendix - Common Data Blocks – Market Data Incremental Refresh (tag 35-MsgType=X) for examples of Book Management and Statistic data blocks.

FIX Message Specification

DataMine Market Depth provides historical data in FIX format. Customers should use the following tables to read DataMine Market Depth files.

FIX Header (across messages)

Header

Tag	FIX Name	Format	Valid Values	Description
35	MsgType	String (2)	35 = X	Defines message type. 35 = X - Market Data Incremental Refresh
1128	ApplVerID	String (1)	8 = FIX.5.0.SP1	Specifies the service pack release being applied at message level.
49	SenderCompID	String (7)	CME	Assigned value used to identify firm sending message.
34	MsgSeqNum	SeqNum (9)		Integer message sequence number.

43	PossDupFlag	Boolean (1)	Y = Possible duplicate
			N = Original transmission
				This tag is used in cases of CME internal component failure to indicate a possible retransmission of a duplicate message with the same sequence number. This tag is important in instances that a message is received with duplicate sequence numbers.
				CME will resend messages to guarantee all messages reach client systems. Two messages will not be sent with the same sequence number without this flag on at least one of them. In addition, it is possible to miss the **original transmission** and see the **possible duplicate** only.

52	SendingTime	UTCTimestamp (21)		Time of message transmission (always expressed in UTC (Coordinated Universal Time)

Market Data Incremental Refresh (tag 35-MsgType=X) Message

Body

Tag	FIX Name	Format	Valid Values	Description
75	TradeDate	LocalMktDate (8)		Indicates date of trade referenced in this message in YYYYMMDD format. Absence of this field indicates current day (expressed in local time at place of trade).
268	NoMDEntries	NumInGroup (5)		Number of FIX Market Data Incremental Refresh Data Blocks in the Market Data Incremental Refresh message.

FIX Market Data Incremental Refresh Repeating Group (Data Block)

Tag	FIX Name	Format	Valid Values	Description
➔107	SecurityDesc	String (20)		Security description.
➔279	MDUpdateAction	Char (1)	0 = New 1 = Change 2 = Delete 5 = Overlay	Type of Market Data update action.
➔269	MDEntryType	Char (1)	0 = Bid 1 = Offer 2 = Trade 4 = Opening Price 5 = Closing Price 6 = Settlement Price 7 = Trading Session High Price 8 = Trading Session Low Price E = Simulated Sell F = Simulated Buy M = Prior N = Session High Bid O = Session Low Offer	Type of Market Data entry.
➔286	OpenCloseSettleFlag	MultipleValueString (1)	4 = Entry From Prev Business Day 5 = Theoretical	Flag to indicate the type of entry (4 for settlement price and 5 for theoretical price)

Tag	FIX Name	Format	Valid Values	Description
			Price	
➔83	RptSeq	Int (1)		Sequence number per Instrument update.

➔276	QuoteCondition	MultipleValueString2 (1)	K = Implied
			C = Exchange Best
				Space-delimited list of conditions describing a quote.

➔277	TradeCondition	MultipleValueString2 (1)	E=Opening Trade
			W = Ex-Pit Price
			1 = Price calculated by Globex
				Space-delimited list of conditions describing a trade. Tag 277 is not sent for a last trade price.

➔1023	MDPriceLevel	Int (2)		Position in the book.
➔273	MDEntryTime	UTCTimeOnly (12)		Time of Market Data Entry. Note – This value needs to be zero-padded from the left until there are a full 9 digits.
➔271	MDEntrySize	Qty (12)		Quantity or volume represented by the Market Data Entry.
➔270	MDEntryPx	Price (20)		Price of the Market Data Entry.
➔346	NumberOfOrders	Int (7)		Number of orders in the market.
➔48	SecurityID	String (12)		Unique instrument ID as qualified by the exchange per tag 22-SecurityIDSource.
➔22	SecurityIDSource	String (1)	8 = Exch Symbol	Identifies source of tag 48-SecurityID value. This value is always 8 for CME and is required if tag 48- SecurityID is specified.
➔336	TradingSessionID	String (1)	0 = Pre-opening 1 = Opening Mode 2 = Continuous Trading Mode	Identifier for Trading Session.
➔274	TickDirection	Char (1)	0 = Plus Tick 2 = Minus Tick	Direction of the tick. If there is no value present, then there is no change.
➔451	NetChgPrevDay	PriceOffset (20)		Net change from previous day’s closing price vs. last traded price.
➔1020	TradeVolume	Qty (12)		Total traded volume since the beginning of the session.
➔1070	MDQuoteType	Int (1)	0 = Indicative	Identifies the type of quote.

Tag	FIX Name	Format	Valid Values	Description
➔5797	AggressorSide	Char (1)	1 = Buy 2 = Sell	Indicates which side is aggressor of the trade. If there is no value present, then there is no aggressor.
➔5799	MatchEventIndicator	Char (1)	1 = Beginning of Globex event 2=End of Globex event	Indicates the beginning or the end of a Globex event. If there is no value present, then the message is not at the beginning or the end of a Globex event. **Note:** For this release, only 1 is a valid value. 2 will become a valid value in a future release.

Security Status (35=f)

Tag	FIX Name	Format	Valid Values	Description
55	Symbol	String (6)		Globex instrument group.
48	SecurityID	String (12)		Unique instrument ID as qualified by the exchange per tag 22-SecurityIDSource.
22	SecurityIDSource	String (1)	8 = Exch Symb	Identifies source of tag 48-SecurityID value. This value is always 8 for CME and is required if tag 48- SecurityID is specified.
332	HighPx	Price (20)		Upper price threshold for the instrument. Orders submitted with prices above the upper limit will be rejected.
333	LowPx	Price (20)		Lower price threshold for the instrument. Orders submitted with prices below the lower limit will be rejected.
326	SecurityTradingStatus	Int (2)	2 = Trading Halt 5 = Price Indication 17 = Ready to trade (start of session) 18 = Not Available for trading (end of session) 20 = Unknown or Invalid 21 = Pre-Open 24 = Pre-Cross 25 = Cross 26 = No-Cancel	Identifies the trading status applicable to the transaction.

Quote Request (35=R)

Tag	FIX Name	Format	Valid Values	Description
146	NoRelatedSym	NumInGroup (5)	1	Indicates the number of repeating symbols specified.
➔55	Symbol	String (6)		Ticker symbol.
➔38	OrderQty	Qty (9)		Quantity requested.
➔54	Side	Char (1)	1 = Buy 2 = Sell	Side requested.
➔60	TransactTime	UTCTimestamp (21)		Time of execution/order creation, expressed in UTC (Coordinated Universal Time, also known as "GMT")
➔48	SecurityID	String (12)		Unique instrument ID as qualified by the exchange per tag 22-SecurityIDSource.
➔22	SecurityIDSource	String (1)	8 = Exch Symb	Identifies source of tag 48-SecurityID value. This value is always 8 for CME and is required if tag 48- SecurityID is specified.
➔537	QuoteType	Int (1)	0 = Indicative 1 = Tradable	Type of quote requested.
131	QuoteReqID	String (23)		Quote request ID defined by the exchange.

Revision History

Initial Release	Version	Last Update	Author	Description
1/20/09	1.0	N/A	LM	Initial Release
1/20/09	1.1	3/25/09	LM	Modified step 4 on page 3 (order in which to process the text files).
1/20/09	1.2	4/8/09	LM	Corrected text in File Processing section.
1/20/09	1.3	11/03/09	AB	Added exchange code specifications to File Processing section, clarified language on page 3.