



NFX Market Data Feed

# NFX MARKET DATA FEED INTERFACE SPECIFICATIONS

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## **1 Introduction**

The NFX Futures market will disseminate its NFX Market Data Feed to vendors and other recipient thru NFX's IP multicast distribution network.

### **1.1 Purpose**

The purpose of this document is to provide recipients of the NFX Market Data Feed with the specifications describing the various messages and their formats, which will comprise this market data feed. This specification is based on the ITC Specification Version 2.1.

### **1.2 Architecture**

Both the primary ("A feed") and secondary ("B feed") will be hosted by servers co-located with the trading system.

Please note that NASDAQ OMX has determined to provide local redundancy in the NY Metro Area ("A" and "B" feeds), while using the Mid-Atlantic Region ("C" feed) for disaster recovery.

## 2 Session Characteristics

### 2.1 Real-time production Data

- Every real-time message from the NFX trading system will be transmitted between the normal trading hours as specified by NFX.
- The control message “Start of Day” (C/D) will be transmitted before NFX disseminates real-time production messages to signal the start of official data.

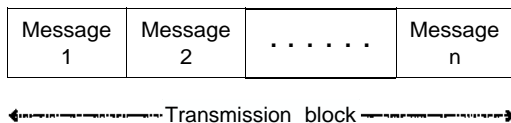
### 2.2 Pre-Launch Test Data

- To facilitate vendor testing for new releases of either NFX or the vendor’s systems, test data will be disseminated over NFX production IP multicast network.
- Test data feed will always be sent after the control message “Start of Test” (C/A) is sent by NFX.

### 2.3 Transmission characteristics

#### 2.3.1 Transmission Block

Encapsulated within each IP packet is a transmission block. One type of transmission block is used for all types of messages:



A block can have a maximum of 1,000 characters inclusive of text.

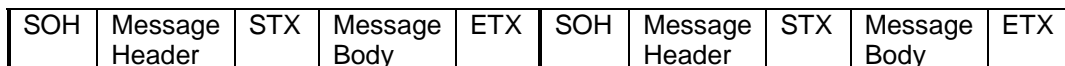
#### 2.3.2 SOH, STX and ETX

Each message header will start with the control character Start of Header (SOH) (x01). The body of each message following the message header will start with the Start of Text (STX) (x02) and end with the control character End of Text (ETX) (x03).

#### 2.3.3 Message Block Format

A message block can consist of multiple messages. A message is a unit of data that can be processed by the receiving station independently of other data with each message consisting of a message Header and, with the exception of certain control messages, message text.

A message may not span a block boundary.



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### 2.3.4 Data format

ASCII filler characters are inserted, as required, in accordance with the following rules:

1. Zeros (hex 30) are inserted in Numeric fields. All Numeric fields are right justified, as required.
2. Spaces (hex 20) are inserted in Alphabetic fields. All Alphabetic fields are left justified, as required.
3. Spaces (hex 20) are inserted in alphanumeric fields. All Alphanumeric fields are right or left justified, as required.

### 2.3.5 Character set

All transmissions will be in standard 8-bit ASCII code.

## 2.4 Retransmissions

A vendor may request a retransmission of a single message or a group of messages by calling the FDDS control center's phone number. Retransmissions will be sent on a separate line. The requesting vendor needs to specify the following information with the request:

1. Vendor identification (Vendor ID or name)
2. Multicast group whose messages need to be retransmitted
3. Start and end sequence number for the intended messages.

Retransmission request(s) will be handled according to the following:

- Retransmission requests are only accepted after the Start of Day (C/D) message is sent.
- The Vendor Identification field in the message header of each message retransmitted will contain a two (2)-character identification of the vendor that requested the retransmission.
- If more than one vendor requests retransmission of the same message (same sequence number), then the retransmission will be addressed to all vendors by specifying the vendor id as "AV" ("All Vendors")
- The Message Sequence Number in the message header for the retransmitted messages will contain the sequence number of the original message
- If the Message Sequence Number counter for a line has been reset, no messages transmitted prior to reset are available for retransmission.
- Retransmissions will be processed so as not to interfere with the transmission of current messages.
- Retransmissions will be sent on a separate message block and will never be combined with the original messages.
- Control message are not retransmitted. However, certain control messages can be resent on request. e.g. SOD, EOD, SOT, EOT.

### 3 Market Data

Following is the list of messages that NFX will distribute to the vendors as part of this NFX Market Data Feed.

- Start of Day - A message to indicate the start of official transmissions.
- End of Day - A message to indicate the end of official transmissions..
- Product Halt - This is to indicate the trading halt in the specific product.
- Product Trade Resumption - A Message to indicate that trading is resumed for the product.
- Quote dissemination – PBBO (NFX Best Bid / Best Offer) dissemination
- Trade Dissemination – Normal trade message
- Block trade – A block trade message represents an exception trade.
- Corrections – Trade corrections and Trade cancel messages.
- Open Interest – This message will normally be sent after Start of Day message and prior to market opening. The message will indicate the cleared volume and open interest as of end of the last trading day.
- High/Low/Last Trade Price – A message sent to indicate the High, Low and Last trade price for a contract as and when High or Low changes. High/Low/Last will also be sent in an event of trade correction (or cancellation) in case trade correction or trade cancel changes the High or Low or last trade price.
- Settlement price – Settlement prices will be sent following the close of trading in a product and always before summary messages are sent.
- Retransmission - This will be handled as described in section “Session Characteristics” by FDDS system.
- Summary messages - These messages representing the trade summary messages will be sent at the end of trading day. Summary messages will be preceded by a start of summary message and will be followed by an end of summary message.
- Admin/ Text Messages- Free text messages to communicate miscellaneous events.
- Refresh – Refresh is not supported in current version of the specification.
- Range Quote – Use of Range Quote for indicative opening is TBD and not planned for version 1 of this specification.

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## 4 Field Groups

Most messages are comprised of 'Field Groups' defined in this section. Each field group contains one or more fields defined below.

E.g.: Field group 'Price ID' is used for all prices.  
 'Price ID' field group consists of individual fields to identify whether the price is decimal or fraction, specified as 1/1<sup>th</sup>, 1/10<sup>th</sup>, 1/100<sup>th</sup>, 1/1000<sup>th</sup> or 1/10000<sup>th</sup>

Note: If any Field / Field-Group is N/A than that Field / Field-Group along with any dependent Fields / Field-Groups will contain spaces.

The following sections explain the 'Field groups' used by the messages in this specification.

### 4.1 Message Header

The Message header will consist of the following fields. Each message will contain this fixed length header followed by a variable length 'text' containing details of the message specified by the category code.

Field Name	Len	Value	Source/Description
SOH Control Character	1	Ctrl-A	
Exchange ID	2	'P'	Exchange identifier for NFX.
Vendor ID	2		Vendor to which retransmissions are sent. Spaces in normal transmissions. Vendor Id "AV" is used when retransmitting to all vendors.
Product Classification Code	1	'F', 'O', 'A'	'F' – Futures contract 'O' – Option Contract 'A' – Administrative (control messages)
Category Code	1	'B', 'C', 'F', 'H', 'I', 'J', 'T', 'X', 'Q', 'E'	Denotes details of the message content 'B' = Bid & Ask 'C' = Control Message 'F' = Market condition 'H' = High/Low/Last Trade price 'I' = Open Interest 'E' = Exceptional Quotation (Used for Block Trades) 'T' = Bid/Ask/Trade – General form (Trades and Trades corrections) 'J' = Summary Message 'Q' = Settlement Price 'X' = Text Message
Type Code	1	Space (' '), 'D', 'R'  'D', 'I',	Usage type ' ' – Regular Transmission 'D' – Delete (With category code other then 'C') 'R' – Revise 'D' – Market Open (with category code 'C') 'I' – Market Close (with category code 'C')

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Message Day Code	1	0-9, A-U	Trading day (Day of the month) 1-9 = 1 <sup>st</sup> to 9 <sup>th</sup> 0 = 10 <sup>th</sup> A-U = 11 <sup>th</sup> -31 <sup>st</sup>
Message Sequence Number (MSN)	7	0000000 to 9999999	Sequence number of the message Reset to 0 every morning.  All Control Messages contain the sequence number of last Market Data Message that was transmitted on the line. (See the message formats and their explanations for Market Data and Control Messages)
Message Time Stamp	7	HHMMSSST	Time stamp of the message in terms of <b>Eastern Standard Time</b> . HH = Hours MM = Minutes SS = Seconds T = Tenth of a second Note: The Timestamp is the actual Transaction Time. NFX does not guarantee that Timestamp will always be in the increasing order of time across different category of messages but does guarantee the time will be equivalent or increasing for the same category of messages. Vendor should have capability to insert time and sales record based on the Timestamp provided.
Session ID	1	'B'	Note: Session Id of Line Integrity / Simulated Data Warning Control Messages will be blank.
STX Control Character	1	Ctrl-B	
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**4.2 Product Classification**

This field group will contain the information related to the instrument used in the message. The product classification code field group's layout is extensible for different types of products (PCC Code). This facilitates different types of product symbol information to be classified into this field group.

**4.2.1 Future contract (PCC Code 'F'):**

Field Name	Len	Value	Source/Description
Product classification type (PCT)	1	Space	Space – No further definition included.
Futures Commodity code	3	“NNN” where ‘N’ belongs to { ‘A’-‘Z’, ‘0’-‘9’ }	3 character left justified space-padded Future Commodity code as listed.
Future Day code	1	Space – N/A, 1-9 = 1-9  0 = 10, A- U = 11-31	
Future Month Code	1	F – Jan G – Feb H – Mar J – Apr K – May M – Jun N – Jul Q – Aug U – Sep V – Oct X – Nov Z - Dec	
Future Year code	2	Last 2 digits of year.	
Last Trading date Day code	1	Space – N/A, 1-9 = 1-9  0 = 10, A- U = 11-31	Blank – N/A
Last Trading date Month Code	1	F – Jan G – Feb H – Mar J – Apr K – May M – Jun N – Jul Q – Aug U – Sep V – Oct X – Nov Z – Dec	Blank – N/A
Last Trading date Year code	2	Last 2 digits of year.	Blank – N/A
	<b>12</b>		

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4.2.2 Option contract (PCC Code ‘O’):

Field Name	Len	Value	Source/Description
Product classification type (PCT)	1	Space	Space – No further definition included
Option Instrument code	3	“NNN” where ‘N’ belongs to {‘A’-‘Z’, ‘0’-‘9’}	3 character Left justified space-padded Option symbol/code as listed
Option Day code	1	Space – N/A, 1-9 = 1-9 0 = 10, A- U = 11-31	Space – N/A
Option Month Code	1	F – Jan G – Feb H – Mar J – Apr K – May M – Jun N – Jul Q – Aug U – Sep V – Oct X – Nov Z - Dec	F- Z = Jan - Dec
Option Year code	2	Last 2 digits of year.	
Put/Call Code	1	‘P’= Put, ‘C’=Call	
Strike Price	7		7 digit Strike price as a whole number. Decimal places of the price will be defined by the “Strike price fractional indicator code” field. Example:- Value of 123.675 will be represented as: strike price = 0123675 strike price fractional indicator code = 3
Strike Price Sign	1	Blank	N/A
Expiration Indicator	1	‘A’ – American Style  ‘E’ – European	
Underlying Future Commodity Code	3	“NNN” where ‘N’ belongs to {‘A’-‘Z’, ‘0’-‘9’}	3 characters left justified space-padded Underlying Future Commodity code
Underlying Future Day Code	1	Space – N/A, 1-9 = 1-9 0 = 10, A- U = 11-31	

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Underlying Future Month Code	1	F – Jan G – Feb H – Mar J – Apr K – May M – Jun N – Jul Q – Aug U – Sep V – Oct X – Nov Z – Dec	
Underlying Future Year Code	1	Last 2 digits of year.	
Last Trading date Day code	1	Space – N/A, 1-9 = 1-9  0 = 10, A- U = 11-31	Space – N/A
Last Trading date Month Code	1	F – Jan G – Feb H – Mar J – Apr K – May M – Jun N – Jul Q – Aug U – Sep V – Oct X – Nov Z – Dec	Blank – N/A
Last Trading date Year code	2	Last 2 digits of year.	Blank – N/A
Strike Price Fractional Indicator	2	Decimal places for strike price field.	Right Justified field, with leading '0' '0' = 1/1 '1' = 1/10 '2' = 1/100 '3' = 1/1000 '4' = 1/10000 Please see the description of field "Strike Price".
Strike Price Indicator	1	Space	Normal
	<b>32</b>		

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### 4.3 Price ID

This field group is used to represent the price information (actual prices, percentage changes etc.)

Field Name	Len	Value	Source/Description
Price Fractional Indicator Code	2	'0', '1', '2', '3', '4'	'0' – 1/1 <sup>th</sup> '1' – 1/10 <sup>th</sup> '2' – 1/100 <sup>th</sup> '3' – 1/1000 <sup>th</sup> '4' – 1/10000 <sup>th</sup>
Price	7	NNNNNNN	Price – Zero filled, right justified
Price Sign	1	'+', '-'	'+' – Positive number '-' – Negative number
BAT Code	1	'B', 'A', 'T', Space	'B' = Bid 'A' = Ask 'T' = Trade Space = Other i.e. Settlement, opening
Price Indicator	1	' ', 'B', 'F', 'L'	' ' = Normal 'B' = Blank out on price displays  'F' = Fast ( with BAT code 'A' or 'B') 'L' = Late Trade (with BAT code 'T')
	12		

### 4.4 Indicators

Each message identifies the indicators and values appropriate to that particular message.

## 5 Message Definitions

### 5.1 Quote/PBBO dissemination

Quote messages (NFX Best Bid/Offer) are sent during the hours defined for trading. The PBBO includes all liquidity from quotes and orders at the best price. Whenever there is no quote for either the bid or offer (or both) the PBBO will be sent with indicators to blank the price. If either the bid or offer is in fast market, the fast market indicator for that side will be set – bid and offer may be in fast market independent of one another.

Category Code: B, Type code: Space

Field Group	Len	Description	Source/Description
Header	25	Header	Message header
Product Classification	12 (PCC "F") 32 (PCC "O")	Futures or Option	Product details
Price ID	12	BAT Code: 'B',  Price Indicator: 'Space'= Normal,  'B'= Blank Out the associated price (If there is no Bid price)  'F' = Fast Market/Non-Firm	Best Bid Price. This price can be set to zero independent of offer price.
Bid Size	5	Bid Size	Best Bid Size
Price ID	12	BAT Code: 'A',  Price Indicator: 'Space'= Normal  'B' = Blank Out the associated price (If there is no offer price)  'F' = Fast Market/Non-Firm	Best Offer Price. This price can be set to zero independent of bid price.
Ask Size	5	Ask Size	Best Ask Size
ETX	1	ETX	
	72 (PCC "F") 92 (PCC "O")		

## 5.2 Trade Dissemination

Trade messages are sent during the hours defined for trading. The trade message will report price and size in each message.

Category Code: T (Bid/Ask/Trade – General Form) , Type code: Space

Field Group	Len	Description	Source/Description
Header	25	Header	Message header
Product Classification	12 (PCC "F") 32 (PCC "O")	Futures or Option	Product details
Price ID	12	BAT Code: 'T',  Price Indicator: 'Space'  Price Indicator: 'L'	Trade Price  The Late indicator is possible in case of a manual trade which is a contingency mechanism
Volume Traded	5	Trade Size	
Volume Indicator	1	'A' – Actual	
ETX	1	ETX	
	56 (PCC "F") 76 (PCC "O")		

## 5.3 Trade Cancel

A Trade cancel message is sent during the hours defined for trading in order to cancel a previous trade for that day. The trade message will include all of the information from the original trade. The As Of sequence number will identify the MSN of the trade being canceled.

Category Code: T, Type code: D - Deleted

Field Group	Len	Description	Source/Description
Header	25	Header	Message header
Product Classification	12 (PCC "F") 32 (PCC "O")	Futures or Option	Product details
Price ID	12	BAT Code: 'T',  Price Indicator: ' ' – Normal	Trade Price of Trade being canceled
Volume Traded	5	Trade Size	Size of Trade being canceled
Volume Indicator	1	'A' – Actual	
As-Of-Sequence Number	7	Sequence number of Trade message being canceled.	

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ETX	1	ETX	
	63 (PCC "F") 83 (PCC "O")		

**5.4 Trade Correction (Revised Trade)**

A Trade correction message is sent during the hours defined for trading in order to correct a previous trade for that day. The trade message will include the corrected information along with the balance of information from the original trade. The As Of sequence number will identify the MSN of the trade being corrected.

Category Code: T, Type code: R - Revise

<b>Field Group</b>	<b>Len</b>	<b>Description</b>	<b>Source/Description</b>
Header	25	Header	Message header
Product Classification	12 (PCC "F") 32 (PCC "O")	Futures or Option	Product details
Price ID	12	BAT Code: 'T',  Price Indicator: Depending on corrected Trade property	Corrected Trade Price
Volume Traded	5	Trade Size	Corrected Trade Size
Volume Indicator	1	'A' – Actual	
As-Of-Sequence Number	7	Sequence number of Trade message being revised	
ETX	1	ETX	
	63 (PCC "F") 83 (PCC "O")		

### 5.5 Block trade (Exceptional Quotation)

Block Trade messages are sent during the hours defined for trading. The block trade message will be sent as an Exception Quote category message and will report price and size of the block trade.

Block trade messages may be generated even during a period in which a trading halt has been

declared. Categorycode: E, Type code: Space

Field Group	Len	Description	Source/Description
Header	25	Header	Message header
Product Classification	12 (PCC "F") 32 (PCC "O")	Futures or Option	Product details
Price ID	12	BAT Code: 'T', Price Indicator: 'Space'	Trade Price
Volume Traded	5	Trade Size	
Volume Indicator	1	'A' – Actual	
Exceptional Indicator	1	'B' – Block Trading	
ETX	1	ETX	
	57 (PCC "F") 77 (PCC "O")		

### 5.6 Block trade (Exceptional Quotation) Cancel

A Block Trade cancel message is sent during the hours defined for trading in order to cancel a previous block trade for that day. The block trade message will include all of the information from the original trade. The As Of sequence number will identify the MSN of the block trade being canceled.

Category Code: E, Type code: D - Delete

Field Group	Len	Description	Source/Description
Header	25	Header	Message header
Product Classification	12 (PCC "F") 32 (PCC "O")	Futures or Option	Product details
Price ID	12	BAT Code: 'T', Price Indicator: 'Space'	Trade Price
Volume Traded	5	Trade Size	
Volume Indicator	1	'A' – Actual	
Exceptional Indicator	1	'B' – Block Trading	

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As-of-Seqno	7	Sequence number of Block Trade message being canceled	
ETX	1	ETX	
	64 (PCC "F") 84 (PCC "O")		

### 5.7 Block trade (Exceptional Quotation) Correction

A Block Trade correction message is sent during the hours defined for trading in order to correct a previous block trade for that day. The block trade message will include the corrected information along with the balance of information from the original block trade. The As Of sequence number will identify the MSN of the block trade being corrected.

Category Code: E, Type code: R - Revise

Field Group	Len	Description	Source/Description
Header	25	Header	Message header
Product Classification	12 (PCC "F") 32 (PCC "O")	Futures or Option	Product details
Price ID	12	BAT Code: 'T', Price Indicator: 'Space'	Trade Price
Volume Traded	5	Trade Size	
Volume Indicator	1	'A' – Actual	
Exceptional Indicator	1	'B' – Block Trading	
As-of-Seqno	7	Sequence number of Block Trade message being corrected	
ETX	1	ETX	
	64 (PCC "F") 84 (PCC "O")		

### 5.8 High/Low/Last Trade Price

A High/Low/Last message is sent to indicate the High, Low and Last trade price for a contract as and when High or Low changes. High/Low/Last will also be sent in an event of trade correction (or cancellation) in case the trade correction or trade cancel changes the High, Low or last trade price.

Note: block trades will not be considered for making High, Low or Last

Category Code: H, Type code:  
Space

Field Group	Len	Description	Source/Description
Header	25	Header	Message header
Product Classification	12 (PCC "F") 32 (PCC "O")	Futures or Option	Product details
Price ID	12	BAT Code: 'T', Price Indicator: 'Space'	High Price
Price ID	12	BAT Code: 'T', Price Indicator: 'Space'	Low Price
Price ID	12	BAT Code: 'T', Price Indicator: 'Space'	Last Price
ETX	1	ETX	
	74 (PCC "F") 94 (PCC "O")		

### 5.9 Open Interest

Open Interest messages will normally be sent after Start of Day message and prior to market opening. The message will indicate the cleared volume and open interest as of the day indicated (normally the prior trading day).

Category Code: I, Type code: Space

Field Group	Len	Description	Source/Description
Header	25	Header	Message header
Product Classification	12 (PCC "F") 32 (PCC "O")	Futures or Option	Product details
Cumulative Volume	7	Total volume traded for this product	Volume Cleared as of date noted by Cumulative Volume Day Indicator
Volume Indicator	1	'A' – Actual	
Day Indicator	1	Space – N/A, 1-9 = 1-9 0 = 10, A- U = 11-31	Cumulative Volume Day Indicator - (Normally the Prior Trading Day)
Open Interest	7	Open Interest	Number of contracts open as of date noted by Open Interest Day Indicator .
Open Interest Indicator	1	'A' - Actual	
Day Indicator	1	Space – N/A, 1-9 = 1-9 0 = 10, A- U = 11-31	Open Interest Day Indicator – (Normally the Prior Trading Day).
ETX	1	ETX	
	56 (PCC "F") 76 (PCC "O")		

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**5.10 Settlement Price**

Settlement prices will be sent following the close of trading in a product and always before summary messages are sent. High and Low limits are not applicable and not used in this message.

Category Code: Q (Settlement Price & limits), Type code: Space

Field Group	Len	Description	Source/Description
Header	25	Header	Message header
Product Classification	12 (PCC "F") 32 (PCC "O")	Futures or Option	Product details
Price ID	12	BAT Code: Space (Settlement)  Price Indicator: 'Space'	Settlement Price
Day Indicator	1	Space – N/A, 1-9 = 1-9  0 = 10, A- U = 11-31	Day indicator for the Trading Day.
Price ID	12	Price: Space  BAT Code: Space  Price Indicator: 'B'	High Limit - Not Used
Price ID	12	Price: Space  BAT Code: Space  Price Indicator: 'B'	Low Limit – Not Used
Day Indicator	1	Space – N/A, 1-9 = 1-9  0 = 10, A- U = 11-31	Space – Not Used
ETX	1	ETX	
	76 (PCC "F") 96 (PCC "O")		

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### 5.11 Summary messages

Summary messages are sent at the end of day. The beginning and end of summary messages will be marked by control messages and text messages. Following represents the typical sequence of these messages:

- Start of Summary: Control Message, Type Code: F
- Multiple Summary messages: Category Code: 'J', Type Code: Space
- End of Summary: Control Message, Type Code: G

Summary Message: Following is the format for Summary

message. Category Code: J, Type Code: Space

Field Group	Len	Description	Source/Description
Header	25	Header	Message header
Product Classification	12 (PCC "F") 32 (PCC "O")	Futures or Option	Product details
Price ID	12	BAT Code: 'T'  First Opening Price	Opening trade for the session
Price ID	12	Second Opening Price	Filled with blanks
Range Indicator	1	Opening Price Range Indicator	O – Open
Market Direction Indicator	1	Opening market direction indicator	Opening Market Direction Indicator is opening price tick with respect to previous day's closing price
Price ID	12	BAT Code: 'T'  High Price	Highest price of the session.
Price ID	12	BAT Code: 'T'  Low Price	Lowest price of the session
Price ID	12	BAT Code: 'T'  Settlement Price	Settlement Price
Price ID	12	BAT Code: 'T'  First Closing Price	Last trade of the session
Price ID	12	Second Closing Price	Filled with blanks
Range Indicator	1	Closing Price Range Indicator	C – Close
Market Direction Indicator	1	Closing Price tick	Closing Price Market Direction Indicator is an indication of the last trade price's tick with respect to previous trade price.
Price ID	12	BAT Code: Space  Net change	Net change is difference between today's closing price and previous day's closing price.

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Market Direction Indicator	1	Net Change tick	Net Market Direction Indicator is an indication of the closing price's tick with respect to previous day's closing price.
Cumulative Volume	7	Total Volume traded	Total Volume Traded
Volume Indicator	1	'A' - Actual	Volume Indicator
Day Indicator	1	Space – N/A, 1-9 = 1-9  0 = 10, A- U = 11-31	Day of the month
ETX	1	ETX	
	148 (PCC "F") 168 (PCC "O")		

### 5.12 Admin / Free Text Message

Free text messages are used to communicate miscellaneous events and information

Category Code: X, Type Code: Space

Field Group	Len	Description	Source/Description
Header	25	Header	Message header
Text	80	Free Text	Free Text
ETX	1	ETX	
	106		

### 5.13 Control Messages

Control messages are provided to notify vendors’ systems of significant status changes of FDDS and to test system integrity.

Control messages will consist of:

- A standard header including a category code and a type code explicitly identifying the control message
- 46 P/A characters

Control messages will not be blocked or combined with any other type of messages. Each control messages is sent in a separate block.

The following table describes the structure of a control message:

Field Group	Len	Source/Description
Header	25	Message header
Control Message Text	46	Varies based on the type code (See control message types for details)

The following are the control messages sent by FDDS:

Message identification Category type		Control message
C	A	Start of Test
C	B	End of Test
C	D	Start of Day
C	F	Start of Summary
C	G	End of Summary
C	K	Reset Sequence Number
C	I	End of Day
C	T	Line Integrity Verification
C	S	Simulated Data Warning

Each control message is described in detail in the following subsections.

*Please note that recipients should be attentive to the session ID in the header of the control messages to ensure that they are properly interpreted by the recipients as pertaining to the appropriate session.*

#### 5.13.1 Start of Test Cycle – Category C, Type A

The Start of Test Cycle message is transmitted to signal the start of the transmission of a Test Cycle. The Start of Test Cycle message will consist of the standard Message Header immediately followed by the control text:

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“START OF TEST MMDDYY HHMMSS”

The Message Sequence Number (MSN) of any Start of Test Cycle message will contain the MSN of the last test message transmitted.

### 5.13.2 End of Test Cycle - Category C, Type B

The End of Test Cycle message is transmitted to signal the end of the transmission of a Test Cycle message.

The End of Test Cycle message will consist of the standard Message Header immediately followed by the control text:

“END OF TEST MMDDYY HHMMSS”

The MSN field will contain number of the last test message transmitted in the test cycle message transmission

### 5.13.3 Start of Day - Category C, Type D

The Start of Day message from NFX signals the start of normal data distribution over a line. The Start of Day message will consist of the standard Message Header immediately followed by control message text:

“START OF DAY MMDDYY HHMMSS”

The MSN field will contain the MSN of the last original message. Normally it will contain sequence number zero because no messages are transmitted before start of day.

### 5.13.4 End of Day – Category C, Type I

The End of Day message from NFX signals the end of transmission of original data over the lines.

The End of Day message will consist of the standard Message Header immediately followed by control message text:

“END OF DAY MMDDYY HHMMSS”

The MSN field will contain number of the last message transmitted that was not a retransmitted message.

### 5.13.5 Start of Summary – Category C, Type F

The Start of Summary message is transmitted by NFX to signal the beginning of transmission of one or more End of Day Summary messages by NFX.

The Start of Summary message will consist of the standard Message Header immediately followed by the textual message:

“START OF SUMMARY – MMDDYY HHMMSS”

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The MSN field will contain number of the last message transmitted that was not a retransmitted message.

### 5.13.6 End of Summary – Category C, Type G

The End of Summary message is transmitted by NFX to signal the end of transmission of one or more End of Day Summary messages by NFX.

The End of Summary message will consist of the standard Message Header immediately followed by the textual message:

“ END OF SUMMARY – MMDDYY HHMMSS”

The MSN field will contain number of the last message transmitted that was not a retransmitted message.

### 5.13.7 Reset Sequence Number – Category C, Type K

The Reset Sequence Number message is transmitted to advise vendors when the sequence numbers on the line require resetting.

The Reset Sequence Number message will consist of the standard Message Header immediately followed by the textual message:

“ SET MESSAGE SEQUENCE NUMBER”

The MSN field will contain the number to which the sequence number is to be reset.

### 5.13.8 Line Integrity Verification – Category C, Type T

The Line integrity verification message will be transmitted each minute to verify the sustained integrity of the communication link. This message will not interrupt normal transmission in progress. It will be transmitted even if no other types of messages are queued.

The Line Integrity Verification message will consist of the standard Message Header immediately followed by the textual message:

“ LINE INTEGRITY MMDDYY HHMMSS”

The MSN field is not incremented for Line Integrity messages. The Message sequence number field will contain the MSN of the last original message.

### 5.13.9 Simulated Data Warning – Category C, Type S

The Simulated Data Warning message will be transmitted each minute in place of Line Integrity message to verify the sustained integrity of the communication link when system is in Test Cycle, see Start of Test Cycle – Category C, Type A. This message will not interrupt normal transmission in progress. It will be transmitted even if no other types of messages are queued.

The Simulated Data Warning message will consist of the standard Message Header immediately followed by the textual message:

“ SIMULATED DATA WARNING HHMMSS”

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The MSN field is not incremented for Simulated Data Warning messages. The Message sequence number field will contain the MSN of the last original message.

### 5.14 Product Halt / Resume

Product Halt messages are used to indicate the trading halt in the specified product. A quote message with price/size set as zero and price indicator set to 'B' (blanking) will follow a trading halt message in a product. No other quotes or trade messages (except block trades) will be sent during the period of trading halt.

Product Resume messages are used to indicate resumption of trading in the specified product. A re-opening will be conducted following the Product Resume and a new opening trade may be sent (if an opening trade is possible) followed by the PBBO quote.

A complete Market Halt will be implemented thru a series of Product Halt messages for each product. Similarly, Market Resume will be implemented thru a series of Product Resumption messages for each product.

If a trading halt persists through to the end of the day, there will be no Product Resume messages. The normal settlement and summary messages will be disseminated at normal scheduled times.

Category code: F, Type Code: Space

Field Group	Len	Description	Source/Description
Header	25	Header	Message header
Product Classification	12 (PCC "F") 32 (PCC "O")	Future or Option	Product details
Market Condition Indicator	1	'A' – Halt Trading  'B' – Resume Trading	
ETX	1	ETX	
	39 (PCC "F") 59 (PCC "O")		

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**6 Message Map**

Following table maps the future market data to ITC message category and type code used for sending that message to vendors.

<b>Future Market data – Message</b>	<b>ITC Message category, Type Code</b>	<b>Description</b>	<b>Comments</b>
Start of Day	Control message Category: C, Type code: D	Start of Official Transmission message	
End of Day	Control message Category: C, Type code: I	End of Official Transmission message	
Product Halt	Category code: F, Market Condition Indicator: A	Market Condition message with Market Condition indicator set to Halt Trading.	A Product Halt message will be followed by a PBBO with bid/ask size and prices set to 0.
Product Trade Resumption	Category code: F, Market Condition Indicator: B	Market Condition with Market Condition indicator set to resume Trading.	
Quote Dissemination (Best Bid Offer)	Category code: B	Bid & Ask	
Trade Dissemination	Category Code: T, Type code: space	Bid/Ask/Trade – General form	Trade message with Trade Volume
Block Trade	Category Code: E, Type Code: Space, Exception Indicator: 'B'	Exceptional Quotation	
Trade Corrections	Category code: T with Type code: R (revise) with As-Of-Sequence number of Trade Message.  Price Indicator will be set according to price of new trade price.	A trade message with Type code "Revise".	.
Trade Cancel	Category Code: T with Type code: D (delete) with As-Of-Sequence number of Trade Message.	A trade message with Type code "Delete".	

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<b>Future Market data – Message</b>	<b>ITC Message category, Type Code</b>	<b>Description</b>	<b>Comments</b>
Block Trade Corrections	Category code: E with Type code: R (revise) with As-Of-Sequence number of Trade Message.  Price Indicator will be set according to price of new block trade price.	A block trade message with Type code "Revise".	.
Block Trade Cancel	Category Code: E with Type code: D (delete) with As-Of-Sequence number of Trade Message.	A block trade message with Type code "Delete".	
Open Interest	Category Code: I, Type Code: Space	Volume & Open Interest	Sent prior to start of trading session
High/Low/Last Trade price	Category Code: H, Type Code: Space	High- Low- Last Message	Sent during the trading session when new High or Low is established. A Trading High or Low could also change due to trade cancellation and Trade corrections.
Retransmission	Please refer to section "Session characteristics"		
Settlements	Category Code: Q, Type code: Space	Settlement Price Message	
Start of summary	Category Code: C, Type Code: F	Control Message: Start of summary	
Summary	Category Code: J, Type Code: Space	Summary Messages	
End of Summary	Category Code: C, Type Code: G	Control Message: End of Summary	
Informational Messages/Admins/Free Text	Category: X, Type Code: Space	Free Text Messages	A text of up to 80 characters.

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### Appendix A: NFX Timelines

Note: Time ranges shown are approximate times. Actual times may be dependent on daily traffic volume and are subject to change based on NFX's discretion. All times are Eastern Time.

#### Session B

<u>Time</u>	<u>Transmission</u>
7:30 am	Start of day on all lines
7:30 am – 8:20 am	Open interest/cleared volume
8:20am	Trading begins
4:15 pm	Trading ends
4:15 pm - 4:30 pm	Settlement calculation and dissemination
4:30 pm	Start of summary
4:30 – 5:00 pm	Summary messages
5:00 pm	End of summary
5:15 pm	End of day on all lines

“Start of Test” (C/A) and “End of Test” (C/B) control messages will be sent at the beginning and end of testing when FDDS or vendor(s) schedules a test outside the normal trading hours.

“Line Integrity Verification” (C/T) messages will be sent out after the lines are started.

Messages received outside the “Start of Day” - “End of Day” window should also be processed by recipients.

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## Appendix B: Revision History

<b>Version</b>	<b>Date</b>	<b>Comments</b>	<b>Approval</b>
Draft	8/30/05	Draft	
Draft	2/21/05	- Modified Length of Product Classification in High/Low/Last message to account for differences in Futures and Options (p 20, sec 3)	
Final 1.0	10/16/06	- Added specification for simulated data warning message (p 26 & 29)	