



# Cboe Futures Exchange FIX Order Entry Implementation Guide

Version 1.0.3

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## 1 Introduction

The Cboe Futures Exchange (“CFE”) provides both FIX and binary order entry protocols. The FIX-based order entry protocol for CFE is based on the FIX protocol used for existing Bats BZX and EDGX Options Exchanges. **This document is provided to assist customers with migration of an existing Bats Options Exchange FIX version 2.3.5 implementation for use with CFE FIX version 1.1.4.** As a result, this document provides a point-in-time guide to porting from an Options Exchange FIX implementation for use with CFE. Consult the revision history of future FIX Specification revisions as necessary as the protocol specifications evolve to accommodate new exchange features and functionality.

This document follows the same structure as the CFE FIX Specification. In each section, the differences relevant to porting an existing Options Exchange FIX implementation are highlighted.

Note that the customer reference of “Member” throughout the Options specification has been updated to “TPH” throughout the CFE FIX specification as is a more applicable reference per the CFE rule book.

### 1.1 Overview

See the [CFE FIX Specification](#) for an overview of the CFE FIX specification.

### 1.2 Hours of Operation

Hours of operation are specific to the CFE Exchange. Trading hours on CFE are product specific and are updated as appropriate when new Futures contracts are listed. See the [CFE FIX Specification](#) for CFE hours of operation.

### 1.3 Data Types

Data types for representing Timesamps and Prices are the same between CFE and Options FIX implementations.

### 1.4 CFE Protocol Features

Customers implementing the CFE FIX protocol should read this section closely to understand protocol features designed to accommodate CFE functionality.

#### 1.4.1 Spread Instruments

CFE introduces Spread instrument trading. The following sections highlight protocol details related to Spread instrument trading.

##### 1.4.1.1 Spread Symbology

When new Simple instruments are listed on CFE, all two-leg Sell-Buy Spread instruments, with the earliest expiring contract as the Sell leg, are created automatically by the system and made available for trading. Other two, three and four leg instruments supported on CFE can be created by contacting

the CFE Trade Desk (See [CFE FIX Specification](#)). CFE does not support dynamic instrument creation via order entry protocols.

Spread instruments are assigned a Bats symbology ID the same as Simple instruments. Once a Bats symbology ID is assigned to an instrument (Simple or Spread) the ID will not change until the associated instrument expires. Bats symbology mappings are available via a symbol mapping file download as with Options exchanges. In addition, TOP and PITCH feeds contain Futures Instrument Definition (“FID”) messages that present symbol detail for all active symbols that repeat throughout the trading day on a one-minute cycle.

#### **1.4.1.2 Spread Trading**

Spread instrument orders are submitted using the same `New Order Single` FIX message that is used for Simple instruments. See ‘1.4.5 - CFE and Options Specific Fields’ below for specific field differences between CFE and Options exchanges order entry protocols.

Spread instrument orders must use Bats symbology in the `Symbol` (55) field of the `New Order Single` message whereas Simple instrument orders may alternatively place the associated Product name (e.g., “VX”) in `Symbol` (55) and specify the expiration date of the target contract using `MaturityMonth` (200) and `MaturityDay` (205) fields.

When a Spread instrument order is filled, customers receive multiple `Execution Report` messages that then describe the Spread instrument execution and individual leg prints comprising the Spread execution. CFE does not guarantee that Spread instrument execution `Execution Report` messages and the associated leg print `Execution Report` messages are contiguous. The `SecondaryExecID` (527) field is used to unambiguously associate leg print `Execution Report` messages to a Spread instrument execution. In addition, the `MultilegReportingType` (442) field characterizes an `Execution Report` as a Spread execution or Simple instrument comprising a leg of a Spread execution.

#### **1.4.2 Carried Order Restatements**

CFE introduces Good ‘till Cancel (“GTC”) orders as well as multi-segment trading days. As a result, orders on the book may persist from session to session. Customers can opt for restatement messages to be sent when the trading system transitions from suspended to queuing at the beginning of a trading session using the Carried Order Restatements port attribute. See the corresponding section of the [CFE FIX Specification](#) for details on Carried Order Restatements.

Note that no notification is provided at the end of a trading session to indicate when GTC orders or Day orders on partial holiday sessions are persisted to carry over to the next trading sessions. Instead, Carried Order Restatements can be used by members to be notified of orders that have persisted from the previous session.

### 1.4.3 Post-Settlement Execution Restatements

CFE introduces products for which trades are not cleared at the time of execution. Instead, customers are notified with ‘pending execution reports’ at the time of execution. Information available only after daily settlement prices for an associated contract are required before the trade can be cleared. At this time, customers will receive an ‘execution restatement’ containing the trade attributes that are used in clearing post-settlement. The details of price, size and symbol transformation and associated messages are product specific and are explained in detail in this section of the [CFE FIX Specification](#).

### 1.4.4 Spread Instruments and Signed prices

CFE supports both Simple and Spread instrument trading. For each product, certain Spread instruments are automatically available for trading and others can be created via a request submitted to the CFE Trade Desk. To accommodate Spread trading, prices in CFE FIX are represented using signed values. This section in the CFE FIX Specification contains details related to Spread instrument trading and conventions used for signed prices.

### 1.4.5 CFE and Options Specific Fields

Fields that appear in the CFE FIX specification but are not contained in the Options FIX specification are presented in the following list. See the indicated message in the [CFE FIX Specification](#) for a detailed specification of each field and its use.

Tag	Field Name	Message Containing Definition
6	<i>AvgPx</i>	Execution Report
14	<i>CumQty</i>	Execution Report
75	<i>TradeDate</i>	Execution Report
424	<i>DayOrderQty</i>	Execution Report
425	<i>DayCumQty</i>	Execution Report
426	<i>DayAvgPx</i>	Execution Report
828	<i>TrdType</i>	Execution Report
1028	<i>ManualOrderIndicator</i>	New Order Single
9702	<i>CtiCode</i>	New Order Single
25004	<i>OEoid</i>	New Order Single
21050	<i>ClearingPrice</i>	Execution Report
21051	<i>ClearingSize</i>	Execution Report
21053	<i>ClearingSymbol</i>	Execution Report

Conversely, fields that appear in the Options FIX specification but are not contained in the CFE FIX specification are presented in the following table. See the indicated message in the [Options FIX Specification](#) for a detailed specification of each field and its use.

Tag	Field Name	Message Containing Definition
5937	<i>MarketingFeeCode</i>	Execution Report
6253	<i>DrillThruProtection</i>	New Order Multileg
7693	<i>MassCancel</i>	Order Cancel, Purge Request
7694	<i>ContraCapacity</i>	Execution Report

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7697	<i>MassCancelLockOut</i>	Order Cancel, Purge Request
7933	<i>RoutingFirmID</i>	New Order Single, New Order Cross
8020	<i>DisplayRange</i>	New Order Single
8641	<i>NoOfSecurities</i>	Security Definition
9040	<i>AutoMatch</i>	New Order Cross
9044	<i>AutoMatchPrice</i>	New Order Cross
9303	<i>RoutingInst</i>	New Order Single
9350	<i>RoutDeliveryMethod</i>	New Order Single
9370	<i>AuctionID</i>	Execution Report
9400	<i>RoutStrategy</i>	New Order Single
9479	<i>DisplayIndicator</i>	New Order Single
9618	<i>MaxRemovePct</i>	New Order Single
9690	<i>WorkingPrice</i>	Execution Report
9691	<i>InitialDisplayPrice</i>	Execution Report
9732	<i>AttributedQuote</i>	New Order Single
9849	<i>LastPriority</i>	New Order Cross
9946	<i>GiveUpFirmID</i>	New Order Cross

#### 1.4.6 Mass Cancel Specification

CFE introduces a new, more flexible and extensible method of specifying mass cancel operations associated with `Order Cancel Request` and `Purge Request` messages. The new method uses a new *MassCancelInst* (Mass Cancel Instruction) field that replaces the previously used *MassCancel* and *MassCancelLockout* fields (See ‘1.4.5 - CFE and Options Specific Fields’ above).

Customers are encouraged to study the difference between the legacy *MassCancel* and *MassCancelLockout* based mass cancellation method in the Options FIX specification and the new *MassCancelInst* method in the CFE FIX Specification when porting an options exchange implementation of FIX for use with CFE. Details can be found in the documentation of the `Order Cancel Request` and `Purge Request` messages.

Note that future versions of options exchange FIX specifications will migrate to the new *MassCancelInst* method of specifying mass cancel operations.

#### 1.4.7 SecurityType Field

In CFE FIX, the *SecurityType* (167) field must be provided on the `New Order Single` message or the message will be rejected. Further, the value of the field must be “FUT” for simple instrument orders or “MLEG” for spread instrument orders. The order will be rejected if value is not provided, is unrecognized or if the value does not correspond to the type of the target symbol. The value provided by the customer is echoed back in the *SecurityType*(167) field of the `Execution Report` message.

## **2 Protocol**

### **2.1 Message Format**

CFE FIX protocol requires that the customer provide the value “CFE” in the standard header field *TargetCompld* whereas the FIX protocol for options exchanges requires the value “BATS” for BZX Options and “EDGX” for EDGX Options exchanges.

### **2.2 Sequence Numbers**

CFE sequence numbers, for both inbound and outbound, are reset to “1” between 4:00PM CST and 4:45PM CST. For Options exchanges, sequence numbers are reset while the exchange is in the closed state between 3:15PM CST and 6:30AM CST the following day.

### **2.3 Version Compatability**

Both CFE and Option Exchange FIX implementation use the FIX 4.2 session protocol.

### 3 Sessions

The Sessions functionality description is largely the same between CFE and Options Exchange FIX specifications including Connectivity (with the exception of the value provided for *TargetCompld*), Logging In, Heartbeating, Replay and Sequence Numbers and Sequence Reset, Heartbeats and Logging Out.

CFE introduces GTC orders and the ability to request that all open GTC orders be “restated” to the client after session logon. See section 3.2.1 of the [CFE FIX Specification](#) for a description of the use of the ‘Carried Order Restatements’ for details.

With the addition of GTC orders, CFE introduces the ability to configure whether the auto-cancellation of orders on disconnect should apply to GTC orders or whether GTC orders should be preserved. See section 3.8.1 of the [CFE FIX Specification](#) for details.



## 4 FIX Messages

### 4.1 Standard Message Header

Aside from the destination ID values for *TargetCompld*, the standard message header is identical between Options and CFE FIX specifications.

### 4.2 Standard Message Trailer

The standard message trailer is the same between Options and CFE FIX specifications.

### 4.3 User Defined and Custom FIX Fields

The CFE FIX Specification presents User Defined FIX Fields (tags 5,000-9,999) and Custom FIX Fields (20,000-39,999) in separate similarly named sections. The Options FIX Specification presents only a single section named “Cboe Specific Fields”, which contains fields from the User Defined FIX Fields range of 5,000-9,999 in use by Options Exchanges. No fields from the Custom FIX Field range 20,000-39,999 are used by Options FIX.

### 4.4 Order Protocol – Customer to Exchange (TPH to CFE)

The set of Customer-to-Exchange messages in the CFE FIX specification is a subset of the messages contained in the Options FIX specification. The following are the set of Options messages that are not present in the CFE:

- `New Order Cross (MsgType="s")`
- `New Order Multileg (MsgType="AB")`
- `Security Definition Request (MsgType="c")`

The additional messages in Options FIX support two-sided crossing orders (i.e. Bats Auction Mechanism “BAM” orders), Complex orders, and dynamic complex instrument creation. In CFE, Spread (Complex) orders are submitted using the standard `New Order Single` message and dynamic instrument creation through order entry protocols is not supported in CFE.

### 4.5 Order Protocol – Exchange to Customer (CFE to TPH)

The set of Exchange-to-Customer messages in the CFE FIX specification is a subset of the messages contained in the Options FIX specification. The following are the set of Options messages that are not present in the CFE:

- `Security Definition (MsgType="d")`

The `Security Definition` message is specific to dynamic complex instrument creation via order entry protocols in Options exchanges, which is not supported in CFE.

## Revision History

Version	Date	Description
1.0.0	08/30/17	Initial version
1.0.1	09/06/17	Modified description of <i>New Order Single SecurityType(167)</i> field in Protocol Features section. Value is either FUT or MLEG depending on type of specified symbol.
1.0.2	10/17/17	Cboe branding/logo changes.
1.0.3	04/16/18	Updated field name of <i>OperatorID (25004)</i> to <i>OEOID</i> .