



CME Globex

Electronic Trading Concepts

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1 Overview

CME Globex is the CME Group electronic trading platform which provides buyers and sellers access to markets on the most diverse array of futures and options products in the world. This guide introduces CME Globex trading concepts customers should be familiar with prior to implementing an interface to trade markets on the CME Globex platform.

This guide provides information on the following topics.

- Trading Instruments on CME Globex
- Instrument Types
 - Outright futures
 - Futures spreads
 - Outright options
 - Options strategies
 - User Defined Spreads
- Order Management
 - Order Submission
 - Order Types and order type qualifiers
 - Trading on behalf of
 - Average Pricing System
 - Order Cancellation
 - Order Matching
- Request for Quote (RFQ)
- Theoretical Opening Price
- Settlement Prices
- Market Integrity
- Making Markets on CME Globex
 - Market Maker Support
 - Market Maker Protections
- Electronic Trading System Considerations

2 Trading Instruments on CME Globex

Markets available on CME Globex are identified according to Product Complex, Product Group, and Instrument.

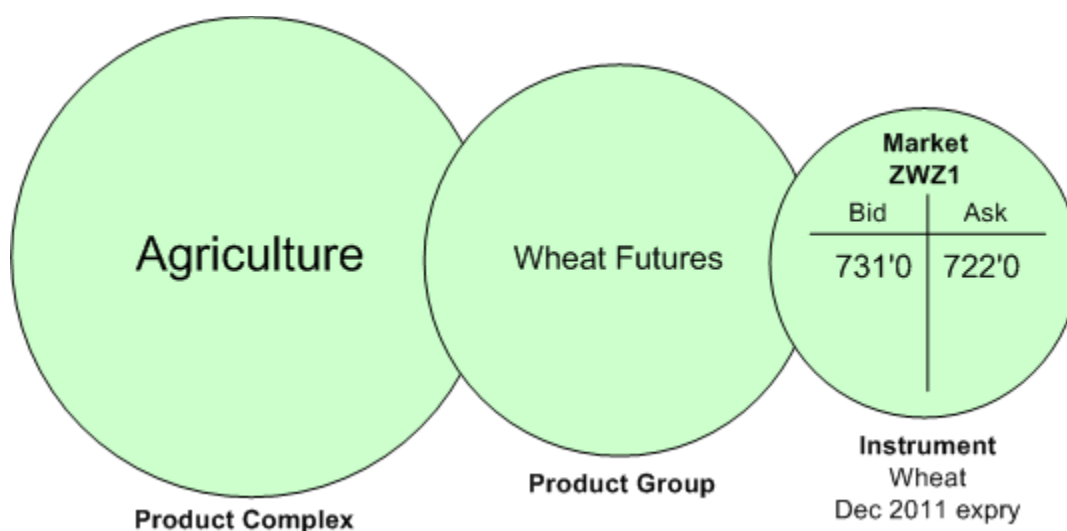
Product Complex - describes a group of products belonging to a given economic sector or market segment. These include:

- Agriculture
- Economic Events
- Environmental
- FX
- Energy
- Equity Index
- Metals
- Interest Rates
- Real Estate
- Weather

Each product complex contains a number of product groups.

Product Group - contains all defined instruments available for trading related to the given product. In the Agricultural product complex, for example, the Corn futures product group denotes all available instruments for corn futures, including each outright instrument representing a different expiration month (and strike price for options) and spread instruments representing the buying and selling of combinations of expiration months (and strike prices for options).

Instrument - an instrument represents the tradable market on which buy and sell quotes and orders are submitted and filled. The instrument defines all attributes of that which is traded, i.e., product complex, product group, expiration, strike price, etc.



Instrument Group – ‘Instrument group’ is a technical term denoting a given number of related instruments as belonging to the same electronic configuration. Certain electronic functions such as broadcast of market state and Marker Maker protections rely on this configuration.

3 Instrument Types Available on CME Globex

3.1 *Outright Futures*

An outright futures instrument defines standardized terms for purchase or sale of an underlying security or physical commodity for future delivery. Standardized terms include:

- underlying asset or instrument
- settlement terms (cash or physical delivery)
- amount and units of underlying asset per instrument
- currency in which the instrument is quoted
- grade of the deliverable
- delivery month
- expiration
- minimum price fluctuation

The term 'outright' denotes a single purchase or sale of an underlying asset for delivery at a single future date (as distinct from a futures spread – see following section).

3.2 *Futures Spreads*

A futures spread instrument represents the simultaneous purchase and/or sale of two or more different but related outright futures instruments (legs), depending upon spread definition.

For example, placing an order on CME Globex to buy futures spread type '1-Year Eurodollar Pack' represents placing an order to buy the March, June, September, and December futures outright instruments.

The remainder of this section describes each futures spread instrument type available on CME Globex.

Legs

The term *leg* refers to one of the instruments comprising a spread, i.e., 'Leg1' refers to the first instrument of the spread, 'Leg2' refers to the second instrument of the spread, 'Leg3' refers to the third instrument of the spread, etc.

3.2.1 Calendar (Horizontal or Diagonal)

A Calendar spread consists of 2 instruments within the same product with different maturity months. There are variations in Calendar spreads based on the product. Each Calendar spread variation is designated through the use of a different spread type code.

Not all CME Group futures spread markets follow the convention where "Buying the Spread" indicates Buying the front expiry and selling the back expiry. The following markets use the logic for Calendar spreads where "Buying the Spread" sells the front expiry month and buys the back expiry month:

- CME FX
- Equity

3.2.1.1 Standard

The standard calendar spread (SP) consists of 2 instruments within the same product group having different maturity months. Buy 1 calendar = buy 1 front month leg, and sell 1 back month leg (+1:-1 ratio).

Products: All Products

Construction: Buy1exp1 Sell1exp2

Example: Buy the Spread

Buy 1 December 2008 Eurodollar and

Sell 1 March 2009 Eurodollar

Instrument Code/Securitydesc: Buying 1 GEZ8-GEH9

Sell the Spread

Sell 1 December 2008 Eurodollar and

Buy 1 March 2009 Eurodollar

Instrument Code/Securitydesc: Selling 1 GEZ8-GEH9

3.2.1.2 Foreign Exchange

Foreign Exchange (FX) consists of 2 instruments within the Foreign Exchange product group and with different maturity months. Due to tick differences between the spread and the outright markets, FX Leg prices from Spread trades may be allowed at non-standard tick increments.

Products: Foreign Exchange (FX) Products

Construction: Buy1exp2 Sell1exp1

Example: Buy the Spread

Buy 1 March 2009 CME EuroFX and

Sell 1 December 2008 CME EuroFX

Instrument Code/Securitydesc: Buying 1 6EH9-6EZ8

Sell the Spread

Sell 1 March 2009 EuroFX and

Buy 1 December 2008 EuroFX

Instrument Code/Securitydesc: Selling 1 6EH9-6EZ8

Note: The Goldman Sachs Commodity Index (GSCI) product, which is classified as an agricultural product, supports the Calendar spread FX strategy.

3.2.1.3 Equities

Equities (EQ) consists of 2 instruments within the same product group and with different maturity months. Buy 1 calendar = sell 1 front month leg and buy 1 back month leg, (-1 : +1 ratio).

Products: CME Equities, CBOT Equities Products

Construction: Sell1exp1 Buy1exp2

Example: Buy the Spread:

Sell 1 December 2008 e-mini S&P and

Buy 1 March 2009 e-mini S&P

Instrument Code/Securitydesc: Buying 1 ESZ8-ESH9

Example: Sell the Spread

Buy 1 December 2008 e-mini S&P and

Sell 1 March 2009 e-mini S&P

Instrument Code/Securitydesc: Selling 1 ESZ8-ESH9

3.2.2 Reduced Tick

Reduced Tick (RT) allows a difference in tick size between the underlying instrument and the spread where the the underlying instrument trades at a larger tick size than the spread market.

Products:

30-Year U.S. Treasury Bond Futures (ZB)

10-Year U.S. Treasury Note Futures (ZN)

5-Year U.S. Interest Rate Swap Futures (SA)

10-Year U.S. Interest Rate Swap Futures (SR)

30-Year Interest Rate Swap Futures (I3)

Silver 5,000 troy ounces - Comex (SI)

Construction: Buy1exp1 Sell1exp2

Example: Buy the Spread

Buy 1 December 2008 30-year US Treasury Bond and

Sell 1 March 2009 30-year US Treasury Bond

Instrument Code/Securitydesc: Buying 1 ZBZ8-ZBH9

Example: Sell the Spread

Sell 1 December 2008 30-year US Treasury Bond and

Buy 1 March 2009 30-year US Treasury Bond

Instrument Code/Securitydesc: Selling 1 ZBZ8-ZBH9

3.2.3 Butterfly

Butterfly (BF) consists of 3 instruments within the same product group and with equally distributed maturity months (e.g., M8-U8-Z8). Buy 1 butterfly = buy 1 of the closer maturity leg, sell 2 of the next maturity leg, and buy 1 of the furthest maturity leg (+1:-2:+1 ratio).

Products: CME Ags, CME Interest rate, CBOT Equities, CBOT Ags, CBOT Interest rate

Construction: Buy1exp1 Sell2exp2 Buy1exp3

Example: Buy the Butterfly

Buy 1 June 2008 Eurodollar and

Sell 2 September 2008 Eurodollar and

Buy 1 December 2008 Eurodollar

Instrument Code/Securitydesc: Buying 1 GE:BFM8-U8-Z8

Example: Sell the Butterfly

Sell 1 June 2008 Eurodollar and

Buy 2 September 2008 Eurodollar and

Sell 1 December 2008 Eurodollar

Instrument Code/Securitydesc: Selling 1 GE:BFM8-U8-Z8

3.2.4 Condor

Condor (CF) consist of 4 instruments within the same product group and with consecutive quarterly maturity months (e.g. Z8-H9-M9-U9). Buy 1 condor = buy 1 of the closer month leg, sell 1 of the next maturity leg, sell 1 of the next maturity leg, and buy 1 of the furthest maturity leg (+1:-1:-1:+1 ratio).

Products: CME Interest Rate, CBOT Ags, Interest Rate

Construction: Buy1exp1 Sell1exp2 Sell1exp3 Buy1exp4

Example: Buy the Condor

Buy 1 December 2008 Eurodollar and

Sell 1 March 2009 Eurodollar and

Sell 1 June 2009 Eurodollar

Buy 1 September 2009 Eurodollar

Instrument Code/Securitydesc: Buying 1 GE:CFZ8H9M9U9

Example: Sell the Condor

Sell 1 December 2008 Eurodollar and

Buy 1 March 2009 Eurodollar and

Buy 1 June 2009 Eurodollar

Sell 1 September 2009 Eurodollar

Instrument Code/Securitydesc: Selling 1 GE:CFZ8H9M9U9

3.2.5 Strip

Strip Spread (FS) is the simultaneous purchase (or sale) of futures positions in consecutive months. The average of the prices for the futures instruments bought (or sold) is the price level of the hedge. A six-month strip, for example, consists of an equal number of futures instruments for each of six consecutive instrument months, also known as a calendar strip. The Strip Spread consists of 4 to 40 instruments within the same product group and with consecutive months. The ratios of the legs can vary.

Strips are constructed as buying a series of instruments simultaneously. Strips will tick in 1-tick increments. Strips can consist of any consecutive months between and including 2-Month Strips to 12-Month Strips.

Products: CME Equities, FX, Ags, CBOT Interest Rates, NYMEX Products

Construction: Buy1exp1 Buy1exp2 Buy1exp3 Buy1exp4

Example: Buy the Strip

Buy 1 September 2008 Crude Oil and

Buy 1 October 2008 Crude Oil and

Buy 1 November 2008 Crude Oil

Buy 1 December 2008 Crude Oil

Instrument Code/Securitydesc: Buying 1 CL:FS 03M U8

Example: Sell the Strip

Sell 1 September 2008 Crude Oil and

Sell 1 October 2008 Crude Oil and

Sell 1 November 2008 Crude Oil

Sell 1 December 2008 Crude Oil

Instrument Code/Securitydesc: Selling 1 CL:FS 03M U8

3.2.6 Inter-Commodity

Inter-Commodity spreads (IS) consist of two futures instruments of different products. Tick increments must be the same value. The expiration month does not matter.

Construction: Buy1exp1com1 Sell1exp1com2

Example: Buy the Spread

Buy 1 December 2008 13-week US Treasury Bill and

Sell 1 March 2009 Eurodollar

Instrument Code/Securitydesc: Buying 1 GTBZ8-GEH9

Example: Sell the Spread

Sell 1 December 2008 13-week US Treasury Bill and

Buy 1 March 2009 Eurodollar

Instrument Code/Securitydesc: Selling 1 GTBZ8-GEH9

3.2.7 Pack

Pack (PK) are the simultaneous purchase or sale of an equally weighted, consecutive series of four Eurodollar futures, quoted on an average net change basis from the previous day's close. The Pack Spread consists of 4 instruments with the same product group and consecutive quarterly maturity months (M8-U9-Z9-H9) with each leg (+1:+1:+1:+1 ratio).

Products: Eurodollar Interest Rate

Construction: Buy1exp1 Buy1exp2 Buy1exp3 Buy1exp4

Example: Buy the Pack

Buy 1 June 2008 Eurodollar

Buy 1 Sept 2008 Eurodollar

Buy 1 Dec 2008 Eurodollar

Buy 1 March 2009 Eurodollar

Instrument Code/Securitydesc: Buying 1 GE:PK 01Y M8

Example: Sell the Pack

Sell 1 June 2008 Eurodollar

Sell 1 Sept 2008 Eurodollar

Sell 1 Dec 2008 Eurodollar

Sell 1 March 2009 Eurodollar

Instrument Code/Securitydesc: Selling 1 GE:PK 01Y M8

3.2.8 Month Pack

Month-Pack (MP) consists of selling 1 pack with a later maturity and buying 4 outright instruments of the same instrument month with a maturity earlier than the front month of the pack.

The strategy is listed with the month code followed by a space, then the pack code. For example, GE:MP Z8 1YZ9 would represent 4 of the GEZ8 futures vs. the Z9 1-year Pack (GEH9, GEM9, GEU9, GEZ9)

Products: Eurodollar Interest Rate

Construction: Buy4exp1 Sell (Pack)1exp2

Example: Buy the Spread

Buy 4 December 2008 Eurodollar Futures and

Sell 1 March 2009 Eurodollar Pack

Pack= March2009, June2009, Sept2009, Dec2009

Instrument Code/Securitydesc: Buying 1 GE:MP Z8 1YH9

Example: Sell the Spread

Sell 4 December 2008 Eurodollar Futures and

Buy 1 March 2009 Eurodollar Pack

Pack= March2009, June2009, Sept2009, Dec2009

Instrument Code/Securitydesc: Selling 1 GE:MP Z8 1YH9

3.2.9 Pack Butterfly

Pack-Butterfly (PB) consists of a butterfly spread with each of the legs being a Pack. Buy 1 pack-butterfly = buy 1 of the closer maturity pack, sell 2 of the next maturity pack, and buy 1 of the furthest maturity pack.

Products: Eurodollar Interest Rate

Construction: Buy (Pack)1exp1 Sell (Pack)2exp2 Buy (Pack)1exp3

Example: Buy the Spread

Buy 1 December 2008 Eurodollar Pack

Sell 2 December 2009 Eurodollar Pack

Buy 1 December 2010 Eurodollar Pack

Instrument Code/Securitydesc: Buying 1 GE:PB Z8-Z9-Z0

Example: Sell the Spread

Sell 1 December 2008 Eurodollar Pack

Buy 2 December 2009 Eurodollar Pack

Sell 1 December 2010 Eurodollar Pack

Instrument Code/Securitydesc: Selling 1 GE:PB Z8-Z9-Z0

3.2.10 Pack Spread

Pack-Spread (PS) consists of a calendar spread with each leg being a Pack with different maturities. Buy 1 pack-spread = buy 1 closer maturity Pack, sell 1 further maturity Pack.

Products: Eurodollar Interest Rate

Construction: Buy (Pack)1exp1 Sell (Pack)1exp2

Example: Buy the Spread

Buy 1 December 2008 Eurodollar Pack and

Sell 1 March 2009 Eurodollar Pack

Dec08 Pack=Dec2008, March2009, June2009, Sept2009

Mar09 Pack=March2009, June2009, Sept2009, Dec2009

Instrument Code/Securitydesc: Buying 1 GE:PS Z8-H9

Example: Sell the Spread

Sell 1 December 2008 Eurodollar Pack and

Buy 1 March 2009 Eurodollar Pack

Dec08 Pack=Dec2008, March2009, June2009, Sept2009

Mar09 Pack= March2009, June2009, Sept2009, Dec2009

Instrument Code/Securitydesc: Selling 1 GE:PS Z8-H9

3.2.11 Double Butterfly

The Double Butterfly (DF) spread is a "calendar" spread between two future butterfly strategies where the second and third leg of the first butterfly are common to the first and second leg of the second butterfly. The net effect of this causes a strategy with 4 legs with equal separation.

Double Butterfly consists of 4 instruments within the same product group and equally distributed maturity months (e.g., Z7-H8-M8-U8). Buy 1 double butterfly = buy 1 of the closer maturity leg, sell 3 of the next maturity leg, sell 3 of the next maturity leg, buy 1 of the furthest maturity leg.

Double Butterfly is equal to the price of Leg 1, minus the price of three Leg 2's, plus the price of three Leg 3's, minus the price of Leg 4.

Products: Eurodollar Interest Rate

Construction: Buy1exp1 Sell3exp2 Buy3exp3 Sell1exp4

Example: Buy the Spread

Buy 1 December 2008 Eurodollar

Sell 3 March 2009 Eurodollar

Buy 3 June 2009 Eurodollar

Sell 1 Sept 2009 Eurodollar

Instrument Code/Securitydesc: Buying 1 ES:DF Z8H9M9U9

Example: Sell the Spread

Sell 1 December 2008 Eurodollar

Buy 3 March 2009 Eurodollar

Sell 3 June 2009 Eurodollar

Buy 1 Sept 2009 Eurodollar

Instrument Code/Securitydesc: Selling 1 ES:DF Z8H9M9U9

3.2.12 Crack 1:1

The Crack One:One (C1) is unique to energy products and consists of 2 different products within the same product group and with the same maturity months. Buy 1 = buy 1 front month leg1 and sell 1 back month leg2 (+1:-1 ratio).

When buying the Crack spread, the user is buying the distilled product (Gasoline or Heating Oil) and selling the Crude Oil. All Crack Spreads will be listed as "same month" instruments.

Products: NYMEX Products

Construction: Buy1exp1Distillate Sell1exp1Crude

Example: Buy the Spread

Buy 1 Sept 2008 Heating Oil

Sell 1 Sept 2008 Crude Oil

Instrument Code/Securitydesc: Buying 1 CL:C1 HO-CL U8

Example: Sell the Spread

Sell 1 Sept 2008 Heating Oil

Buy 1 Sept 2008 Crude Oil

Instrument Code/Securitydesc: Selling 1 CL:C1 HO-CL U8

3.2.13 Bundle

Bundle (FB) consists of 8 to 40 instruments within the same product group and with consecutive quarterly maturity months per block of 4. For instance, a 2-year bundle consists of 8 instruments, a 5-year bundle consists of 20 instruments, and a 10-year bundle consists of 40 instruments. Buy 1 bundle = buy 1 of each leg. The maximum quantity for Bundles is 5000.

Products: Eurodollar Interest Rate

Construction: Buy1exp1 Buy1exp2 Buy1exp3 Buy1exp4 Buy2exp5 Buy3exp6 Buy4exp7 Buy5exp8

Example: Buy the 2-year Bundle

Buy 1 June 2008 Eurodollar

Buy 1 Sept 2008 Eurodollar

Buy 1 December 2008 Eurodollar

Buy 1 March 2009 Eurodollar

Buy 1 June 2009 Eurodollar

Buy 1 Sept 2009 Eurodollar

Buy 1 December 2009 Eurodollar

Buy 1 March 2010 Eurodollar

Instrument Code/Securitydesc: Buying 1 GE:FB 02Y M8

Example: Sell the 2-year Bundle

Sell 1 June 2008 Eurodollar

Sell 1 Sept 2008 Eurodollar

Sell 1 December 2008 Eurodollar

Sell 1 March 2009 Eurodollar

Sell 1 June 2009 Eurodollar

Sell 1 Sept 2009 Eurodollar

Sell 1 December 2009 Eurodollar

Sell 1 March 2010 Eurodollar

Instrument Code/Securitydesc: Selling 1 GE:FB 02Y M8

3.2.14 Bundle-Spread: Buy a Bundle vs. Sell a Bundle

Bundle-Spread (BS) consists of a calendar spread with each leg being a Bundle with different maturities. Buying 1 bundle spread = buying 1 bundle with closer maturity and selling 1 bundle with further maturity.

Bundle Spreads will have an equal number of legs on each leg of the bundle. For instance, a 2-year bundle can only be paired with a second 2-year bundle to create a bundle spread.

Common future legs between the two bundles are not allowed. For example, a June 2008 2-year bundle cannot be spread with a March 2010 2-year bundle, since this would result in a common leg of the March 2010 futures instrument between the two bundles.

June 2008 2-Year Bundle	March 2010 2-Year Bundle
Buy 1 June 2008 Eurodollar	<u>Buy 1 March 2010 Eurodollar</u>
Buy 1 Sept 2008 Eurodollar	Buy 1 Sept 2010 Eurodollar
Buy 1 December 2008 Eurodollar	Buy 1 December 2010 Eurodollar
Buy 1 March 2009 Eurodollar	Buy 1 March 2011 Eurodollar
Buy 1 June 2009 Eurodollar	Buy 1 June 2011 Eurodollar
Buy 1 Sept 2009 Eurodollar	Buy 1 Sept 2011 Eurodollar
Buy 1 December 2009 Eurodollar	Buy 1 December 2011 Eurodollar
Buy 1 March 2010 Eurodollar	Buy 1 March 2012 Eurodollar

Products: Eurodollar Interest Rate

Construction: Buy1(Bundle)exp1 Sell1(Bundle)exp2

Example: Buy the Bundle

Buy 1 June 2008 Eurodollar Bundle

Sell 1 June 2009 Eurodollar Bundle

Instrument Code/Securitydesc: Buying 1 GE:BS 2YM8 2YM9

Example: Sell the Bundle

Sell 1 June 2008 Eurodollar Bundle

Buy 1 June 2009 Eurodollar Bundle

Instrument Code/Securitydesc: Selling 1 GE:BS 2YM8 2YM9

3.3 Outright Options

An outright options instrument represents the right, but not the obligation, to buy or sell an underlying futures instrument at a specified (strike) price. An options position allows three possible courses of action:

- Buy the underlying future at the option strike price -- referred to as 'exercising' the option.
- Sell the option back on the market (if value has increased) -- referred to as 'offsetting'.
- Allow the option to expire (if value has decreased).

There are two types of outright options:

- Call -- the right to buy the underlying futures instrument at the option strike price
- Put -- the right to sell the underlying futures contract at the option strike price

Options confer different obligations according to whether the option is bought or sold as follows:

	Call option	Put option
Option buyer	Buys the right to buy the underlying futures instrument at the specified price	Buys the right to sell the underlying futures instrument at the strike price.
Option seller	Has obligation to assume a short position in the underlying futures market at option strike price if option buyer exercises the call	Has the obligation to assume a long position in the underlying futures market at the strike price if the option buyer exercises the put.

3.3.1 Cabinet

'Cabinet' is the lowest tradable price for an option outright. An order placed at cabinet allows the user to enter an option order with a price less than the minimum tick and have CME Globex recognize the price as valid.

Cabinet trades on CME Globex are executed at a price equal to zero for most CME Globex products. For equity and interest rate products, the minimum tick value (non-zero) is considered cabinet.

Cabinet orders are supported for options outright instruments only.

3.1 Options Strategies

An options strategy instrument represents the simultaneous purchase and/or sale of two or more different but related options instruments (legs), depending upon the strategy definition.

All options strategies on CME Globex are User Defined Strategies (UDS). To define an options strategy, the user submits the desired composition (legs) to CME Globex, which, upon acceptance, broadcasts the instrument definition to the marketplace.

When validating a submitted options strategy, CME Globex makes the distinction between an exchange recognized strategy types and exchange unrecognized strategy type.

- Exchange recognized strategy type -- standard leg configuration formerly in use on floor and/or CME Globex prior to UDS. Example: (BO) butterfly strategy = buy 1, sell 2, buy 1.
- Exchange unrecognized strategy type -- a valid strategy type according to CME Globex UDS construction rules but not conforming to any exchange recognized strategy configuration. Designated generic (GN) strategy type.

3.2 *Exchange Recognized Options Strategy Types*

The following section describes the composition of each exchange recognized options strategy type.

3.3.2 Calendar (Horizontal or Diagonal)

A Horizontal (HO) options strategy consists of buying a call(put) in one expiration month and selling a call(put) in another expiration month at the same strike. A Diagonal (DG) options strategy consists of buying a call(put) in one expiration month and selling a call(put) in another expiration month at a different strike price.

3.3.2.1 Horizontal

A horizontal (HO) options strategy consists of buying a call (put) at a strike in the far month, and selling a call (put) at the same strike in the near month.

Spread ratio: (Buy 1: Sell 1)

Call Horizontal

Construction: Buy1callstrike1exp1 Sell1callstrike1exp2

Example: Call Horizontal

Buy 1 December 2008 Corn 600 Call and

Sell 1 July 2008 Corn 600 Call

Put Horizontal

Construction: Buy1putstrike1exp1 Sell1putstrike1exp2

Example: Put Horizontal

Buy 1 December 2008 Corn 600 Call and

Sell 1 July 2008 Corn 600 Call

3.3.2.2 Diagonal

A Diagonal (DG) options strategy consists of buying a call (put) in one expiration month and selling a call (put) in another expiration month at a different strike price.

Spread ratio: (Buy 1: Sell 1)

Call Diagonal

Construction: Buy1callstrike1exp1 Sell1callstrike2exp2

Example: Call Spread

Buy 1 December 2008 Corn 600 Call and

Sell 1 July 2008 Corn 650 Call

Put Diagonal

Construction: Buy1putstrike1exp1 Sell1putstrike2exp2

Example: Put Spread

Buy 1 December 2008 Corn 600 Put and

Sell 1 July 2008 Corn 650 Put

3.3.3 Straddle

A Straddle (ST) options strategy consists of buying both a call and put option on the same instrument, strike price and expiration date.

Spread ratio: (Buy 1: Buy 1)

Construction: Buy1callstrike1exp1 Buy1putstrike1exp1

Example: Buy the Straddle

Buy 1 December 2008 Eurodollar 9800 Call and

Buy 1 December 2008 Eurodollar 9800 Put

3.3.4 Strangle

A Strangle (SG) options strategy consists of buying a put at a lower strike price and buying a call at a higher strike price within the same instrument and expiration.

Spread ratio: (Buy 1: Buy1)

Construction: Buy1putstrike1exp1 Buy1callstrike2exp1

Example: Buy the Strangle

Buy 1 December 2008 Eurodollar 9800 Put and

Buy 1 December 2008 Eurodollar 9900 Call

3.3.5 Vertical

A Vertical (VT) options strategy is made up of all calls or all puts and consists of buying a call at a strike price and selling a call at a higher strike price or buying a put at a strike price and selling a put at a lower strike price within the same instrument and expiration date.

Spread ratio: (Buy 1: Sell 1)

Call Vertical

Construction: Buy1callstrike1exp1Sell1callstrike2exp1

Example: Call Spread

Buy 1 December 2008 Eurodollar 9800 Call and

Sell 1 December 2008 Eurodollar 9900 Call

Put Vertical

Construction: Buy1putstrike2exp1 Sell1putstrike1exp1

Example: Put Spread

Buy 1 December 2008 Eurodollar 9900 Put and

Sell 1 December 2008 Eurodollar 9800 Put

Note: In the case of equity options Vertical strategy, the Spread Type code is VT, but the instrument code/Security Definition uses a different convention of VC for Vertical Call and VP for Vertical Put. For example: Equity Call – ES:VCZ8C1305 1285 or Equity Put – ES:VPZ8P1305 1285.

3.3.6 Box

A Box (BX) options strategy consists of buying the call and selling the put at the same lower strike price and buying the put and selling the call at the same higher strike all within the same instrument and expiry month.

Spread ratio: (Buy 1: Sell 1: Buy 1: Sell 1)

Construction: Buy1callstrike1exp1 Sell1putstrike1exp1 Buy1putstrike2exp1 Sell1callstrike2exp1

Example: Box

Buy 1 December mini-sized Dow Index 12000 Call,

Sell 1 December mini-sized Dow Index 12000 Put,

Buy 1 December mini-sized Dow Index 13000 Put,

Sell 1 December mini-sized Dow Index 13000 Call

3.3.7 Butterfly

A Butterfly (BO) options strategy is constructed of all calls (Call Butterfly) or all puts (Put Butterfly). The Call Butterfly consists of buying a call, selling two calls at a higher strike price and buying a call at a still higher strike price within the same instrument and expiry month. The Put Butterfly consists of buying a put, selling two puts at a lower strike price and buying a put at a still lower strike price within the same instrument and expiry month.

The Butterfly requires a specific symmetry in the strikes in that the difference between the strike prices is the same for all legs.

Spread ratio: (Buy 1: Sell 2: Buy 1)

Call Butterfly

Construction: Buy1callstrike1exp1 Sell2callstrike2exp1 Buy1callstrike3exp1

Example: Call Butterfly

Buy 1 December 2008 Eurodollar 9800 Call

Sell 2 December 2008 Eurodollar 9825 Call

Buy 1 December 2008 Eurodollar 9850 Call

Put Butterfly

Construction: Buy1putstrike3exp1 Sell2putstrike2exp1 Buy1putstrike1exp1

Example: Put Butterfly

Buy 1 December 2008 Eurodollar 9850 Put

Sell 2 December 2008 Eurodollar 9825 Put

Sell 1 December 2008 Eurodollar 9800 Put

3.3.8 Conditional Curve

Conditional Curve (CC) options strategies are unique to CMEG Interest rate products and consists of buying a call (put) at a strike in one product group and selling a call(put) at a strike in another product group.

Additionally, it is possible to have a Conditional Curve spread with a single strike (i.e. same for each leg) or two different strikes, where both strikes are listed.

Spread ratio: (Buy 1: Sell 1)

Call Conditional Curve

Construction: Buy1callstrikeexp1 instrument1 Sell1callstrikeexp1 instrument2

Example: Call Conditional Curve

Buy 1 December Eurodollar 9800 Call,

Sell 1 December 1-year Mid-Curve 9800 Call

Put Conditional Curve

Construction: Buy1putstrikeexp1 instrument 1 Sell1putstrikeexp1 instrument 2

Example: Put Conditional Curve

Buy 1 December Eurodollar 9800 Put,

Sell 1 December 1-year Mid-Curve 9800 Put

3.3.9 Condor

A Condor (CO) options strategy is constructed of all calls (Call Condor) or all puts (Put Condor).

The Call Condor consists of buying a call, selling one call at a higher strike price and selling a call at a still higher strike price, and buying a fourth call at a still higher strike price within the same instrument and expiry month.

The Put Condor consists of buying a put at the highest strike price, selling one put at a lower strike price, selling a put at a still lower strike price, and buying a fourth put at an even lower strike price within the same instrument and expiry month.

The Condor requires a specific symmetry in the strikes in that the difference between the strike prices is the same for all legs.

Spread ratio: (Buy 1: Sell 1: Sell 1: Buy 1)

Call Condor

Construction: Buy1callstrike1exp1 Sell1callstrike2exp1 Sell1callstrike3exp1Buy1callstrike4exp1

Example: Call Condor

Buy 1 December 2008 Eurodollar 98000 Call

Sell 1 December 2008 Eurodollar 98500 Call

Sell 1 December 2008 Eurodollar 99000 Call

Buy 1 December 2008 Eurodollar 99500 Call

Put Condor

Construction: Buy1putstrike4exp1 Sell1putstrike3exp1 Sell1putstrike2exp1Buy1putstrike1exp1

Example: Put Condor

Buy 1 December 2008 Eurodollar 99500 Put

Sell 1 December 2008 Eurodollar 99000 Put

Sell 1 December 2008 Eurodollar 98500 Put

Buy 1 December 2008 Eurodollar 98000 Put

3.3.10 Double

A Double (DB) options strategy is constructed of all calls (Call Double) or all puts (Put Double).

The Call Double consists of buying a call at a strike price and buying another call at a higher strike price within the same instrument and expiry month.

The Put Double consists of buying a put at a strike price and buying another put at a lower strike price within the same instrument and expiry month.

Call Double

Construction: Buy1callstrike1exp1 Buy1callstrike2exp1

Example: Call Double

Buy 1 December 2008 Eurodollar 98000 Call

Buy 1 December 2008 Eurodollar 98500 Call

Put Double

Construction: Buy1putstrike2exp1 Buy1putstrike1exp1

Example: Put Double

Buy 1 December 2008 Eurodollar 98500 Put

Buy 1 December 2008 Eurodollar 98000 Put

3.3.11 Horizontal Straddle

A Horizontal Straddle (HS) options strategy consists of buying a straddle at one strike price in the deferred month and selling a straddle at the same or different strike in the near month.

More specifically, a Horizontal Straddle (HS) consists of buying a call and buying a put at the same strike price in the deferred month and selling a call and selling a put at the same lower strike price in the near month, all within the same instrument and expiry month.

Spread ratio: (Buy 1: Buy 1: Sell 1: Sell 1)

Construction: Buy1callstrike1exp2 Buy1putstrike1exp2 Sell1callstrike1exp1 Sell1putstrike1exp1

Example: Horizontal Straddle

Buying 1 Sept 2008 Eurodollar 98000 Call,

Buying 1 Sept 2008 Eurodollar 98000 Put

Selling 1 June 2008 Eurodollar 98500 Call

Selling 1 June 2008 Eurodollar 98500 Put

3.3.12 Iron Condor

A Iron Condor (IC) options strategy consists of buying a put spread and buying a call spread at higher strike prices.

More specifically this consists of selling a put at one strike price, buying a put at a higher strike price, buying a call at a higher strike price, and selling a call at an even higher strike price, all within the same instrument and expiration.

Spread ratio: (Sell 1: Buy 1: Buy 1: Sell 1)

Construction: Sell1putstrike1exp1 Buy1putstrike2exp1 Buy1callstrike3exp1 Sell1callstrike4exp1

Example: Put Spread

Sell 1 June 2008 30 Year Treasury Bond 116 Put,

Buy 1 June 2008 30 Year Treasury Bond 117 Put,

Buy 1 June 2008 30 Year Treasury Bond 118 Call,

Sell 1 June 2008 30 Year Treasury Bond 119 Call.

3.3.13 Ratio 1x2

A Ratio 1x2 (12) options strategy is constructed of all calls (Call Ratio 1x2) or all puts (Put Ratio 1x2).

The Call Ratio 1x2 consists of buying a call and selling two calls at a higher strike price within the same instrument and expiry month.

The Put Ratio 1x2 consists of buying a put at a strike price and selling two puts at a lower strike price within the same instrument and expiry month.

Spread ratio is (Buy 1: Sell 2)

Call 1x2**Construction:** Buy1callstrike1exp1 Sell2callstrike2exp1

Example: Call 1x2

Buy 1 March 2008 Eurodollar 9800 Call

Sell 2 March 2008 Eurodollar 9950 Call

Put 1x2**Construction:** Buy1putstrike2exp1 Buy1putstrike1exp1

Example: Put 1x2

Buy 1 March 2008 Eurodollar 9950 Put

Sell 2 March 2008 Eurodollar 9800 Put

3.3.14 Ratio 1x3

A Ratio 1x3 (13) options strategy is constructed of all calls (Call Ratio 1x3) or all puts (Put Ratio 1x3).

The Call Ratio 1x3 consists of buying a call at one strike price and selling three calls at a higher strike price within the same instrument and expiry month.

The Put Ratio 1x3 consists of buying a put at one strike price and selling three puts at a lower strike price within the same instrument and expiry month.

Spread ratio: (Buy 1: Sell 3)

Call 1x3**Construction:** Buy1callstrike1exp1 Sell3callstrike2exp1

Example: Call 1x3

Buying 1 March 2008 December mini-sized Dow Index 12000 Call

Selling 3 March 2008 December mini-sized Dow Index 13000 Call

Put 1x3**Construction:** Buy1putstrike2exp1 Sell3putstrike1exp1

Example: Put 1x3

Buying 1 March 2008 December mini-sized Dow Index 13000 Put

Selling 3 March 2008 December mini-sized Dow Index 12000 Put

3.3.15 Ratio 2x3

A Ratio 2x3 (23) options strategy is constructed of all calls (Call Ratio 2x3) or all puts (Put Ratio 2x3).

The Call Ratio 2x3 consists of buying two calls at one strike and selling three calls at a higher strike price within the same instrument and expiry month.

The Put Ratio 2x3 consists of buying two puts at one strike price and selling three puts at a lower strike price within the same instrument and expiry month.

Spread ratio: (Buy 2: Sell 3)

Call 2x3**Construction:** Buy2callstrike1exp1 Sell3callstrike2exp1

Example: Call 2x3

Buy 2 March 2008 Eurodollar 9800 Call

Sell 3 March 2008 Eurodollar 9950 Call

Put 2x3

Construction: Buy2putstrike2exp1 Sell3putstrike1exp1

Example: Put 2x3

Buy 2 March 2008 Eurodollar 9950 Put

Sell 3 March 2008 Eurodollar 9800 Put

3.3.16 Strip

A Strip (SR) options strategy is constructed of all calls (Call Strip) or all puts (Put Strip).

The Call Strip consists of buying calls within the same instrument and strike price for each of four consecutive quarterly expiry months, resulting in a total of four (4) calls purchased.

The Put Strip consists of buying puts within the same instrument and strike price for each of four consecutive quarterly expiry months, resulting in a total of four (4) puts purchased.

The Strip requires a specific symmetry in the expiry months in that the time difference between the expiry months is the same for all legs.

Spread ratio: (Buy 1: Buy 1: Buy 1: Buy 1)

Call

Construction: Buy1callstrike1exp1 Buy1callstrike1exp2 Buy1callstrike1exp3Buy1callstrike1exp4

Example: Call

Buy 1 June 2008 Eurodollar 9800 Call

Buy 1 Sept 2008 Eurodollar 9800 Call

Buy 1 Dec 2008 Eurodollar 9800 Call

Buy 1 March 2009 Eurodollar 9800 Call

Put

Construction: Buy1putstrike1exp1 Buy1putstrike1exp2 Buy1putstrike1exp3Buy1putstrike1exp4

Example: Put

Buy 1 June 2008 Eurodollar 9800 Put

Buy 1 Sept 2008 Eurodollar 9800 Put

Buy 1 Dec 2008 Eurodollar 9800 Put

Buy 1 March 2009 Eurodollar 9800 Put

3.3.17 Risk Reversal

A Risk Reversal (RR) options strategy consists of buying a call and selling a put option within the same instrument and expiration month. The put component can be the same strike or a lower strike as the call option.

Spread ratio: (Buy 1: Sell 1)

Construction: Buy1callstrike2exp1 Sell1putstrike1or2exp1

Example: Risk Reversal

Buy 1 June 2008 Eurodollar 9900 Call

Sell 1 June 2008 Eurodollar 9800 Put

3.3.18 Straddle Strips

A Straddle Strip (SS) options strategy consists of buying a call and put within the same instrument at the same strike price (Straddle) for each of four consecutive quarterly expiry months. This results in four (4) Straddles being purchased.

The Straddle Strip requires a specific symmetry in the expiry months in that the time difference between the expiry months is the same for all legs.

Spread ratio: (Buy 1: Buy 1: Buy 1: Buy 1)

Call

Construction: Buy1callstrike1exp1 Buy1putstrike1exp1 Buy1callstrike1exp2 Buy1putstrike1exp2 Buy1callstrike1exp3 Buy1putstrike1exp3 Buy1callstrike1exp4 Buy1putstrike1exp4

Example: Call

Buy 1 June 2008 Eurodollar 9800 Call

Buy 1 June 2008 Eurodollar 9800 Put

Buy 1 Sept 2008 Eurodollar 9800 Call

Buy 1 Sept 2008 Eurodollar 9800 Put

Buy 1 Dec 2008 Eurodollar 9800 Call

Buy 1 Dec 2008 Eurodollar 9800 Put

Buy 1 March 2009 Eurodollar 9800 Call

Buy 1 March 2009 Eurodollar 9800 Put

3.3.19 Xmas Tree

The Xmas Tree (XT) options strategy is constructed of all calls (Call Xmas Tree) or all puts (Put Xmas Tree).

The Call Xmas Tree consists of buying a call at one strike, selling a call at a higher strike and selling yet another call at a higher strike, all within the same instrument and expiration month.

The Put Xmas Tree consists of buying a put at a higher strike and selling a put at a lower strike and selling yet another put at a still lower strike, all within the same instrument and expiration month.

The Xmas Tree requires a specific symmetry in the strikes in that the difference between the strike prices is the same for all legs.

Spread ratio: (Buy 1: Sell 1: Sell 1)

Call Xmas Tree

Construction: Buy1callstrike1exp1 Sell1callstrike2exp1 Sell1callstrike3exp1

Example: Call Xmas Tree

Buy 1 June 2008 Eurodollar 9800 Call

Sell 1 June 2008 Eurodollar 9850 Call

Sell 1 June 2008 Eurodollar 9900 Call

Put Xmas Tree

Construction: Buy1putstrike3exp1 Sell1putstrike2exp1 Sell1putstrike1exp1

Example: Put Xmas Tree

Buy 1 June 2008 Eurodollar 9900 Put

Sell 1 June 2008 Eurodollar 9850 Put

Sell 1 June 2008 Eurodollar 9800 Put

3.3.20 3-Way

A 3-Way (3W) options strategy is constructed of calls and puts on the same instrument and expiry month with different strike prices.

A Call 3-way consists of buying the call for the middle strike price, selling the call for high strike price, and selling the put for the low strike price.

A Put 3-way consists of buying the put for middle strike price, selling the put for low strike price, and selling the call for the high strike price.

Spread ratio: (Buy 1: Sell 1: Sell 1)

Call

Construction: Buy1callstrike2exp1 Sell1callstrike3exp1 Sell1putstrike1exp1

Example: Call Spread

Buy 1 July 2008 Lean Hog 78000 Call

Sell 1 July 2008 Lean Hog 80000 Call

Sell 1 July 2008 Lean Hog 77000 Put

Put

Construction: Buy1putstrike2exp1 Sell1putstrike1exp1 Sell1callstrike3exp1

Example: Put Spread

Buy 1 July 2008 Lean Hog 78000 Put

Sell 1 July 2008 Lean Hog 76000 Put

Sell 1 July 2008 Lean Hog 80000 Call

3.3.21 Iron Butterfly (IB)

An Iron Butterfly (IB) options strategy consists of buying a Straddle and selling a Strangle in the same expiry month. The IB components are to sell a Put at a strike price, buy Put and Call at higher strike price, and sell a Call at an even higher strike price. The strike prices do not have to be consecutive and the gaps between strike prices do not have to be equal.

Spread ratio: (sell 1: buy 1: buy 1: sell 1)

Construction: Sell1putstrike1exp1 Buy1putstrike2exp1 Buy1callstrike2exp1 Sell1callstrike3exp1

Example: Iron Butterfly

Sell 1 March 2009 Ten-Year Treasury Note option 118 Put

Buy1 March 2009 Ten-Year Treasury Note option 120 Put

Buy 1 March 2009 Ten-Year Treasury Note option 120 Call

Sell 1 March 2009 Ten-Year Treasury Note option 122 Call

3.3.22 Jelly Roll

A Jelly Roll (JR) options strategy consists of buying (sell) a Reversal in one expiry month and selling (buy) the Reversal in another expiry month to produce a synthetic spread between both months.

- Leg sequence
 - Sell 1 call
 - Buy 1 put

- Buy 1 call
 - Sell 1 put
- Strike configuration
 - Leg 1 strike = Leg 2 strike
 - Leg 3 strike = leg 4 strike
 - Leg 3 strike \neq leg 1 strike
- Leg Expiration
 - Leg 1 expiration = leg 2 expiration
 - Leg 3 expiration = leg 4 expiration
 - Leg 1 expiration < leg 3 expiration

Spread ratio: (sell 1: buy 1: buy 1: sell 1)

Buy Jelly Roll

Construction: Sell1callstrike1exp1 Buy1putstrike1exp1 Buy1callstrike2exp2 Sell1putstrike2exp2

Example: Buy Jelly Roll

Sell 1 Dec 2009 Eurodollar options 9750 Call

Buy 1 Dec 2009 Eurodollar options 9750 Put

Buy 1 March 2010 Eurodollar options 9825 Call

Sell 1 March 2010 Eurodollar options 9825 Put

Sell Jelly Roll

Construction: Buy1callstrike1exp1 Sell1putstrike1exp1 Sell1callstrike2exp2 Buy1putstrike2exp2

Example: Sell Jelly Roll

Buy 1 Dec 2009 Eurodollar options 9750 Call

Sell 1 Dec 2009 Eurodollar options 9750 Put

Sell 1 March 2010 Eurodollar options 9825 Call

Buy 1 March 2010 Eurodollar options 9825 Put

3.3.23 Guts (GT)

A Guts (GT) options strategy consists of buying a Call at a strike price and buying a Put at a higher strike price in the same expiry.

Spread ratio: (buy 1: buy 1)

Construction: Buy1callstrike1exp1 Buy1putstrike2exp1

Example: Buy the Guts

Buy 1 December 2009 Ten-Year Treasury Note option 120 Call

Buy 1 December 2009 Ten-Year Treasury Note option 122 Put

3.3.24 3-way: Straddle versus Call (3C)

A 3-way: Straddle versus Call (3C) options strategy consists of buying a Straddle and (versus) selling a Call in the same expiry month. The Straddle component consists of buying a Call and buying a Put in the same instrument, expiration, and strike price. The opposing (versus) component is to sell a Call for the same instrument and expiration but at a different strike price.

Spread ratio: (buy 1: buy 1: sell 1)

Construction: Buy1callstrike1exp1 Buy1putstrike1exp1 Sell1callstrike(?)exp1

Example: Buy the 3-way: Straddle versus Call

Buy 1 December 2009 Ten-Year Treasury Note option 120 Call

Buy 1 December 2009 Ten-Year Treasury Note option 120 Put

Sell 1 December 2009 Ten-Year Treasury Note option 123 Call

3.3.25 3-way: Straddle versus Put (3P)

A 3-way: Straddle versus Call (3C) options strategy consists of buying a Straddle and selling a Put in the same expiry month. The Straddle component consists of buying a Call and buying a Put in the same instrument, expiration, and strike price. The opposing component is to sell a Put for the same instrument and expiration but at a different strike price.

Spread ratio: (buy 1: buy 1: sell 1)

Construction: Buy1callstrike1exp1 Buy1putstrike1exp1 Sell1putstrike2exp1

Example: Buy the 3-way: Straddle versus Put

Buy 1 December 2009 Ten-Year Treasury Note option 120 Call

Buy 1 December 2009 Ten-Year Treasury Note option 120 Put

Sell 1 December 2009 Ten-Year Treasury Note option 117 Put

3.4 CME Globex Unrecognized Spread Type (Generic)

If the options strategy requested by the user is not identified as one of the CME Globex exchange recognized strategy types, but has a valid construction, the instrument will be created exactly as the user requested and designated in market data as 'GN' (generic).

Under the generic designation, the user can create options strategy instruments composed of multiple strategy types. For example, a unique options strategy instrument can be created by combining the configurations of a Vertical options strategy and Xmas tree options strategy into a unique Generic instrument.

Generic strategies can contain up to 40 outright. For example, when the user submits a proposed user defined strategy to CME Globex containing an options butterfly as a leg, CME Globex will count that instrument as 4 (buy 1, sell 2, buy 1) instruments against the 40 instrument limit.

The delta neutral, or 'covered' options strategy type having one futures outright or spread as a leg, is also considered a generic strategy type.

3.4.1 UDS Covered Options Spreads

The term **Covered** denotes a unique delta-neutral instrument created by combining an outright option or options spread with one or more underlying outright futures instruments. Covereds are well-suited for traders who commonly use volatility strategies to trade futures and options.

Covereds can be defined with a maximum of 39 futures instruments within the CME Group defined range of the 40 instrument maximum for Covered instruments (i.e. a Covered instrument with 39 futures must have one option outright leg).

Delta

When customers request the creation of a covered, CME Globex validates the proposed delta by performing a 'delta-reasonability' check. During the match process for orders on Covered instruments, CME Globex determines the Covering future quantity by multiplying the outright option or option spread quantity by the absolute value of delta and then rounding according to the rules specific to incoming and resting orders.

Expiration

A Covered instrument either expires with the earliest expiration of its component leg instruments or at the end of the trading session.

Valid Instruments

All listed CME Group outright options and option spreads are available for creating Covered spreads, and all listed outright futures contracts are available as a Covering future.

Both CME Globex exchange recognized and unrecognized spread types may be Covered.

- **CME Globex Exchange Recognized Spread Type** - User-defined option spread that matches the structure of standard CME Globex spread types. For example, a Butterfly option spread where the structure is: buy1 sell2 buy1.
- **CME Globex Unrecognized Spread Type** - User-defined option spread whose structure does not fit the construction of any Globex standard spread type (i.e. Generic).

3.4.2 UDS Construction Rules

Refer to CME Globex Advanced Functionality for comprehensive UDS construction rules.

4 Order Submission and Management

4.1 Order Types

The following order types are supported by CME Globex for futures and options markets.

Order Type	Futures	Options
Limit	X	X
Market Orders with Protection	X	X
Market-limit	X	X
Stop-limit	X	
Stop Orders with Protection	X	
Hidden Quantity	X	X
Minimum Quantity	X	X

4.1.1 Stop-Limit Order (Futures Only)

Stop-limit orders are activated when an order's trigger price is traded in the market. For a bid order, the trigger price must be higher than the last traded price. For a sell order, the trigger price must be lower than the last traded price. After the trigger price is traded in the market, the order enters the order book as a limit order at the order limit price. The limit price is the highest/lowest price at which the stop order can be filled. The order can be filled at all price levels between the trigger price and the limit price. If any quantity remains unfilled, it remains on the order book as a limit order at the limit price.

4.1.2 Stop Order with Protection (Futures Only)

Stop orders with protection are intended to avoid cascading stop orders being filled at extreme prices. A stop order with protection is activated when the market trades at the stop trigger price and can only be executed within the protection range limits. The order enters the order book as a limit order with the protection price limit equal to the trigger price plus or minus the pre-defined protection point range.

Protection point ranges are equal to 50% of the product's "no bust" range. Refer to www.cme.com for a list of the "no bust" ranges for products. For bid orders, protection points are added to the trigger price to calculate the protection price limit. For offer orders, protection points are subtracted from the trigger price.

CME Globex matches the order at all price levels between the trigger price and the protection price limit. If the order is not completely filled, the remaining quantity is placed in the order book at the protection price limit.

Example: Stop Order with Protection (Bid)

The following example illustrates how the client interacts with CME Globex to process a stop order with protection bid.

1. The client sends a Market Order to CME Globex.
 - Bid, ESZ8, Stop Order, 90000 Trigger Price
2. A trade occurs at the trigger price of 90000. The order is activated and CME Globex responds with an Execution Report - Order Confirmation (Notification that order was triggered).

- Trigger Price = 90000, Protection Points = 600
 - Protection Price Limit = $90000 + 600 = 90600$
3. CME Globex sends an Execution Report - Partial Fill.
 - 2-Lot @ 90025
 4. CME Globex sends an Execution Report - Partial Fill.
 - 3-Lot @ 90300
 5. CME Globex sends an Execution Report - Partial Fill.
 - 3-Lot @ 90550
 6. Next Best Offer = 90675. This value exceeds the protection price limit. CME Globex places the remaining quantity on the order book at a protection price limit of 90600.

Example: Stop Order with Protection (Offer)

The following example illustrates how the client interacts with CME Globex to process a stop order with protection offer.

1. The client sends a New Order to CME Globex.
 - Offer, ESZ8, Stop Order (with protection), 90025 Trigger Price
2. CME Globex responds with an Execution Report - Order Confirmation.
3. A trade occurs at the trigger price of 90025. The client's order is activated and CME Globex responds with an Execution Report - Order Confirmation (Notification that order was triggered).
 - Trigger Price = 90025, Protection Points = 600
 - Protection Price Limit = $90025 - 600 = 89425$
4. CME Globex sends an Execution Report - Partial Fill.
 - 2-Lot @ 90000
5. CME Globex sends an Execution Report - Partial Fill.
 - 3-Lot @ 89900
6. CME Globex sends an Execution Report - Partial Fill.
 - 3-Lot @ 89650
7. Next Best Bid = 89300. This value is below the protection price limit. CME Globex places the remaining quantity on the order book at a protection price limit of 89425.

4.1.3 Limit Order

Limit orders allow the buyer to define the maximum purchase price for buying an instrument and the seller to define the minimum sale price for selling an instrument.

Any portion of the order that can be matched is immediately executed. Limit orders submitted for buying an instrument are executed at or below the limit price. Limit orders submitted for selling an instrument are executed at or above the limit price. A limit order remains on the book until the order is either executed, cancelled, or expires.

4.1.4 Market-Limit Order

Market-limit orders are executed at the best price available in the market. If the market-limit order can only be partially filled, the order becomes a limit order and the remaining quantity remains on the order book at the specified limit price.

Example: Market-limit Order (Bid)

1. The client sends a New Order to CME Globex.
 - Bid, ESZ8, Market-Limit.
2. CME Globex responds with an Execution Report - Order Confirmation.
3. The market-limit order becomes a limit order at the best available market price (90025).
4. CME Globex sends an Execution Report - Partial Fill.
 - 2-Lot @ 90025
5. The remaining quantity rests on the book at 90025.

4.1.5 Market Order with Protection

Market orders with protection are intended to avoid cascading market orders being filled at extreme prices. Market orders with protection are filled within a pre-defined range of prices referred to as the protected range. For bid orders, protection points are added to the current best offer price to calculate the protection price limit. For offer orders, protection points are subtracted from the current best bid price.

CME Globex matches the order at the best available price level without exceeding the protection price limit. If the entire order cannot be filled within the protected range immediately, the unfilled quantity remains in the order book as a limit order at the limit of the protected range. Refer to <http://www.cme.com> for a list of the "no bust" ranges for products.

Example: Market Order with Protection (Bid)

The following example illustrates how the client interacts with CME Globex to process a market order with protection bid.

1. The client sends a Market Order to CME Globex.
 - Bid, ESZ8, Market Order.
 - Best Offer = 90025 and Protection Points = 600.
 - Protection Price Limit = $90025 + 600 = 90625$.
2. CME Globex sends an Execution Report - Partial Fill.
 - 2-Lot @ 90025

3. CME Globex sends an Execution Report - Partial Fill.
 - 3-Lot @ 90300
4. CME Globex sends an Execution Report - Partial Fill.
 - 3-Lot @ 90550
5. Next Best Offer = 90675. This value exceeds the protection price limit. CME Globex places the remaining quantity on the order book at a protection price limit of 90625.

Example: Market Order with Protection (Offer)

The following example illustrates how the client interacts with CME Globex to process a market order with protection offer.

1. The client sends a Market Order to CME Globex.
 - Offer, ESZ8, Market Order.
 - Best Bid = 90000 and Protection Points = 600
 - Protection Price Limit = $90000 - 600 = 89400$
2. CME Globex sends an Execution Report - Partial Fill.
 - 2-Lot @ 90000
3. CME sends an Execution Report - Partial Fill.
 - 3-Lot @ 89900
4. CME Globex sends an Execution Report - Partial Fill.
 - 3-Lot @ 89650
5. Next Best Bid = 89300. This value is below the protection price limit. CME Globex places the remaining quantity on the order book at a protection price limit of 89400.

4.2 Order Type Qualifiers

Order type qualifiers establish the duration that the order is active. Order qualifiers are not related to price or volume modification.

CME Globex supports the following order qualifiers:

- Day
- Good-Till-Cancel (GTC)
- Good-Till-Date (GTD)
- Fill-and-Kill (FAK)
- Fill-or-Kill (FOK)

4.2.1 Day

Day orders are intended to be active only during that trading day. Day orders automatically expire at the end of the day and do not carry over to the next trade date. CME Globex assumes that all orders are day orders unless otherwise specified.

4.2.2 Good-Till-cancelled (GTC)

GTC orders remain active in the order book until they are completely executed, cancelled or when the instrument expires.

4.2.3 Good-Till-Date (GTD)

GTD orders remain active on the order book until they are completely executed, expire at the specified date, are cancelled, or when the instrument expires.

4.2.4 Fill-and-Kill (FAK)

FAK orders are immediately executed against resting orders. If the order cannot be fully filled, the remaining balance is cancelled. A minimum quantity can be specified. If the specified minimum quantity cannot be filled, the order is cancelled.

4.2.5 Fill-or-Kill (FOK)

FOK orders must be fully filled immediately or the entire order is cancelled. An FOK order is created by using the FAK qualifier and setting the minimum quantity to the original order quantity.

4.3 *Order Display Quantity*

The display quantity allows you to control the manner in which trades are reported in the market. Also referred to as "maximum show", the display quantity allows you to specify whether or not the entire quantity of an order is reported to the market. You can expose the order to the market gradually.

For example, a user may place an order with a quantity of 1000. If a display quantity value of 100 is submitted with the order, no more than 100 instruments are exposed to the market at any time. Each time 100 instruments are filled, the next 100 instrument order is entered into the market as a new order.

Note: Not available for CME Interest Rate Options.

4.4 *Minimum Order Quantity*

The user can specify a minimum quantity which must be executed for the order. The entire order quantity is displayed to the market.

The following rules apply to Minimum Quantity:

- If an order specifies a minimum quantity, then at least the minimum quantity must be filled immediately.
- If at least the minimum quantity cannot be filled, then the entire order is cancelled.
- If the minimum quantity or more is filled, then the remaining quantity is placed on the book.
- If an order has a minimum quantity equal to the total order quantity then the entire order fills immediately or it is cancelled.
- If an order does not specify a minimum quantity, then the order is treated as a regular order.

4.5 Additional Order Information

4.5.1 Stop Spike Logic

In certain extreme boundary conditions, cascading stop orders could cause the market to trade outside of predefined values (typically the same as the “no bust” ranges). Stop spike logic prevents such excessive price movements by introducing a momentary pause in matching. The affected instrument is placed in a “reserved” state. This momentary trading pause allows new orders to be entered and matched against the triggered stops in an algorithm similar to market opening. Currently, stop spike logic is implemented on all non-implied futures and some options instruments.

Whenever a lead month futures instrument is placed in the reserved state, the options auto-reserve functionality automatically pauses matching in the associated options and options strategies markets. All resting mass quotes are cancelled when the auto-reserve functionality is initiated. This state is maintained for a few seconds after the futures instrument has resumed trading. During the reserved period, customers can submit, modify and cancel orders. Mass quotes are rejected.

4.5.2 Good til Cancel (GTC)/Good til Date (GTD) Submitted Outside Daily Price Limits

Products that have daily limits, based on prior session settlement, cannot trade outside of those daily limits. However, a GTC or GTD order may be entered in most products (Big Equities being the exception) on CME Globex outside of the daily limit. Once accepted, the GTC/GTD will not be actionable until the price comes within the daily (hard) limits of a trading session.

Example: GTD or GTC

1. A GTD or GTC order to buy 10 ZCZ1 @ 5600 is entered.
 - The current daily price limits are 5612 minimum and 6212 maximum.
 - The GTD or GTC order is placed on the book.
2. The market closes and reopens on the next day with price limits of 5412 for the minimum and 6012 for the maximum. The order is now inside the daily range.
3. A sell order comes into the book to sell 10 ZCZ1 @ 5600 which matches against the buy order at 5600. (For purposes of this example, we assume that at time of entry, this incoming order is within current price bands. For clarification of Price Banding functionality, please refer to the *Price Banding* section of this guide).

4.5.3 Trading on Behalf of a Client

CME Globex allows firms to submit orders for clients, as well as other clearing members for whom the firm is authorized to do business:

- A firm trading for itself should populate tag 49-SenderCompID with the value assigned by CME Group to the firm for its own business.
- If the firm is authorized to submit orders for another clearing member (Affiliate, Sub-Accounting or Cross-Margin firm number), the firm should toggle the SenderCompID value to that value assigned by CME Group to the clearing member for whom the business is being done.
- If the firm wants to submit orders for its own client firms who are not clearing members, the firm can populate tag 109-ClientID with any value the firm designates.

The following examples demonstrate how firm 999 can submit orders for itself (example A), another clearing member firm, 998, (example B) or for a client (example C):

- Example A – Firm Submitting Order of Self
Tag 49-SenderCompID = ABC999P
- Example B – Firm Submitting Order for another Clearing Firm
Tag 49-SenderCompID = ABC998P
- Example C – Firm Submitting Order for Client
Tag 49-SenderCompID = ABC999P
Tag 109-ClientID = unique identifier firm assigns to client

4.5.4 Average Pricing System (APS)

APS lets you group multiple orders together and assign them a single average price across the group. All orders designated for averaging in a group must be for the same contract.

There are two ways to designate CME Globex platform trades for the Average Price System:

1. **Group and average multiple orders together.** Enter a “\$” in the first position of the Account number field (tag 1) of each order, the customer account number, followed by a space, followed by an APS Group ID selected by the user. The Group ID enables APS to identify the multiple orders that are to be grouped and averaged together.
2. **Assign an average price to all partial fills associated with a single order.** Enter a “#” in the first position of the Account number field (tag 1), followed by any ad-hoc number that you select.

Fills for orders that are designated using “\$” or “#” as described above are sent to APS. In order for the average price to be calculated and assigned to the fills, the clearing firm must use APS to “complete the group.”

4.6 Order Cancellation

Order cancellation can occur in the scenarios outlined below for an order that has been accepted by CME Globex.

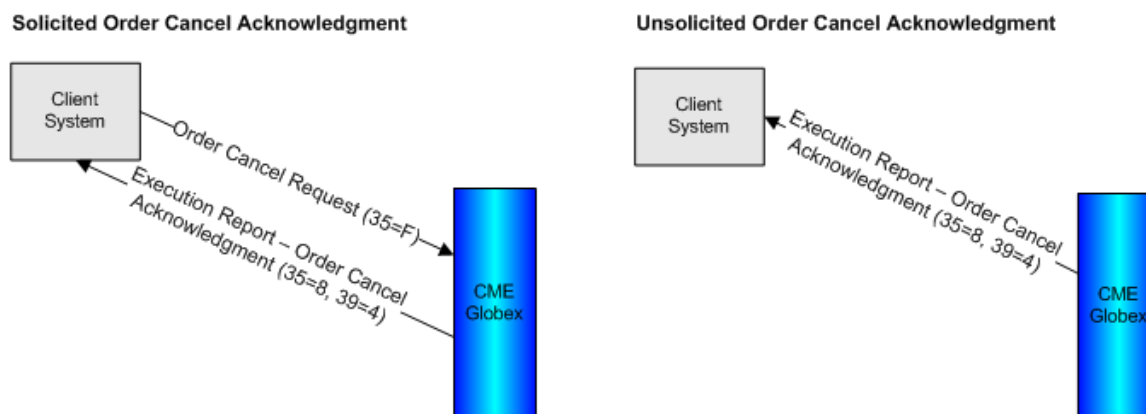
- Solicited order cancel
 - Cancel request is initiated by client system and cancel acknowledgment is expected result.
- Unsolicited order cancel
 - Cancel acknowledgment sent at order expiration
 - Cancel on Disconnect (COD) – client system is registered for COD and hard disconnect cancels all orders
 - Cancel initiated by FirmSoft
 - Cancel initiated by GCC/FAS

4.6.1 Solicited vs Unsolicited Order Cancel Acknowledgments

In CME Globex messaging, an Execution Report (tag 35-MessageType=8) can be triggered in response to a client system request, or sent as notification of an action performed programmatically by the CME Globex platform.

- An Execution Report sent in response to a client system request is a **solicited** Execution Report.
- An Execution Report sent as notification of an action performed programmatically by the CME Globex platform is an **unsolicited** Execution Report.

The illustration below is a basic example of a solicited versus unsolicited Execution Report.



CME Globex messaging behavior for an Execution Report – Order Cancel Acknowledgment (tag 35=8, tag 39=4) is differentiated across solicited and unsolicited messages with the exception highlighted in the table below.

IN THIS EXAMPLE, ASSUME THE INITIAL NEW ORDER WAS SENT WITH TAG 11-ClOrdID = '1111111111'.

Resting order is result of:		ROW	Tag	Solicited Execution Report (35=8)		Unsolicited Execution Report - Order Cancel Acknowledgment (35=8)	
				Column A New Order Acknowledgment	Column B Order Cancel Acknowledgment	Column C GCC/FAS	Column D FirmSoft
Case1	New Order (35=D)	R1	tag 11-CIOrdID	1111111111	2222222222	1111111111	1111111111
		R2	tag 41-OrigCIOrdID	Not sent	1111111111	0	0
		R3	tag 37-OrderID	aaaaaaaaaaaa	aaaaaaaaaaaa	aaaaaaaaaaaa	aaaaaaaaaaaa
		R4	tag 39-OrderStatus	0=New order	4=Cancelled	4=Cancelled	4=Cancelled
				Cancel/Replace Acknowledgment	Order Cancel Acknowledgment	GCC/FAS	FirmSoft
Case2	Cancel/R eplace (35=G)	R5	tag 11-CIOrdID	2222222222	3333333333	2222222222	2222222222
		R6	tag 41-OrigCIOrdID	1111111111	2222222222	1111111111	0
		R7	tag 37-OrderID	aaaaaaaaaaaa	aaaaaaaaaaaa	aaaaaaaaaaaa	aaaaaaaaaaaa
		R8	tag 39-OrderStatus	5=replaced	4=Cancelled	4=Cancelled	4=Cancelled

New Order Acknowledgment sent in response to a New Order (35=D) message.

R1-R4, Column A

- tag 11-ClOrdID is a client-supplied value
- tag 41-OrigClientOrderID, is not sent for the New Order Acknowledgment.

Order Cancel Confirmation – Execution Report (35=8) message sent in response to an Order Cancel Request (35=F) message

R1-R4, Column B

- Example values of a New Order (i.e., the original order; an order which has not been Cancel/Replaced)
- the client-supplied tag 11-ClOrdID value has been changed on the 35=F message to '2222222222'
- the original value from the New Order tag 11-ClOrdID is returned on the acknowledgment in tag 41-OrigClOrdID ('1111111111')

Unsolicited Order Cancel Acknowledgment – Execution Report (35=8) initiated by CME GCC/FAS to cancel a New Order (one that has not been Cancel/Replaced)

R1-R4, Column C

- Important item to note: since this Cancel Acknowledgment is not sent in response to a client message, there is no new value supplied for tag 11-ClOrdID and no previous value to put in tag 41-OrigClOrdID; therefore, tag 11 contains the original client-supplied tag 11-ClOrdID value and tag 41 is sent with '0'.

Unsolicited Order Cancel Acknowledgment – Execution Report (35=8) initiated by CME FirmSoft to cancel a New Order (one that has not been Cancel/Replaced)

R1-R4, Column D

- Important item to note: as with the GCC-initiated cancel, since this Cancel Acknowledgment is not sent in response to a client message, there is no new value supplied for tag 11-ClOrdID and no previous value to put in tag 41-OrigClOrdID; therefore, tag 11 contains the original client-supplied tag 11-ClOrdID value and tag 41 is sent with '0'.

THEREFORE, THERE IS NO WAY TO DISTINGUISH WHETHER THE UNSOLICITED NEW ORDER CANCEL ACKNOWLEDGMENT WAS TRIGGERED BY GCC/FAS OR FIRMSOFT.

Cancel/Replace Acknowledgment (35=8) sent in response to a Cancel/Replace (35=G) message

R5-R8, Column A

- the client-supplied tag 11-ClOrdID value has been changed on the 35=G message to '222222222'
- the original value from the New Order tag 11-ClOrdID is returned on the acknowledgment in tag 41-OrigClOrdID ('111111111')

Order Cancel Confirmation – Execution Report (35=8) message sent in response to an Order Cancel Request (35=F) message used to cancel an order that has been Cancel/Replaced

R5-R8

- the client-supplied tag 11-ClOrdID value has been changed on the 35=F message to '222222222'
- the original value from the New Order tag 11-ClOrdID is returned on the acknowledgment in tag 41-OrigClOrdID ('111111111')

Unsolicited Order Cancel Confirmation – Execution Report (35=8) message initiated by GCC/FAS to cancel an order that has been previously Cancel/Replaced

R5-R8

- Since there are not client-supplied value to update tag 11-ClOrdID and tag 41-OrigClOrdID, the values for these tags from the Cancel/Replace 35=G message are used.

Unsolicited Order Cancel Confirmation – Execution Report (35=8) message for a cancel initiated by FirmSoft on an order that has been previously Cancel/Replaced

R5-R8, Column D

- The FirmSoft-initiated Cancel Replace for tag 11-ClOrdID, uses the value from the Cancel/Replace message (35=G). For tag 41-OrigClOrdID, FirmSoft puts '0'; it is therefore possible to determine if the unsolicited Cancel Acknowledgment for a previously cancel/replaced order was initiated by GCC/FAS or FirmSoft.
- For an order placed on the book with an Order Cancel/Replace Request (35=G) message that is subsequently canceled by CMEG, the unsolicited Order Cancel Acknowledgment will indicate the origin of the cancellation in tag 41-ClOrdID.
 - R6, Column C = '111111111' (GCC/FAS initiated)
 - R6, Column D = '0' (FirmSoft initiated)
 - R6, Column C
 - For a GCC/FAS initiated cancel, the Order Cancel Acknowledgment will contain the original tag 11-ClOrdID value in tag 41-OrigClOrdID.

- For a FirmSoft initiated cancel, tag 41-OrigClOrdID will contain '0'.
- R6, Column D = '0' (FirmSoft initiated)
- For an order placed on the book with a New Order (35=D) message that is subsequently canceled by CMEG, there is currently no differentiation to indicate the internal CMEG origin of the cancellation
- Notice R1 thru R4 are identical for Column C and Column D, i.e., no way to differentiate.

4.7 Order Matching

4.7.1 Match Algorithms

To ensure that each market participant is given the best possible execution at the fairest prices, CME Globex applies algorithms, or predefined rules, when matching orders.

CME Globex uses a variety of matching algorithms. The algorithm used depends on the product traded and the characteristics of the product's marketplace. Match algorithms on CME Globex include:

4.7.1.1 FIFO

The FIFO algorithm (F) fills orders on a strict price and time priority; the first order at a price level is the first order matched.

Orders lose their priority and get re-queued if users:

- Increase the quantity
- Change the price
- Change the account number

4.7.1.2 Pro-Rata

The Pro-Rata algorithm (C) fills orders according to price, order lot size and time. An incoming aggressor order's quantity is multiplied by each resting order's pro-rated percentage to calculate allocated trade quantity. All fills are rounded down to the nearest integer; if an allocated trade quantity is less than one it is rounded down to zero.

An order's pro-rata percentage is calculated by taking order quantity ÷ total quantity at a certain price. Excess lots, which occur as a result of the rounding down of the original allocated trade quantity, are allocated FIFO.

The Pro-Rata algorithm follows these stages to match trades:

- Pro-rata with minimum allocation of one lot
- FIFO for any residual quantity

4.7.1.3 Allocation

The Allocation algorithm (A) is an enhanced pro-rata algorithm that incorporates a priority (top order) to the first incoming order that betters the market. If priority is established, the aggressor orders are first allocated to the top order until the order's quantity is exhausted.

Additionally, there is a minimum pro-rata allocation parameter of two lots. All fills are rounded down to the nearest integer and if an allocated trade quantity is less than two lots, it is rounded down to zero. Excess lots are allocated FIFO.

The Allocation algorithm follows these stages to match trades:

- Assigns a top order percent allocation
- Pro-rata with minimum allocation of two lots
- FIFO for any residual quantity

4.7.1.4 Threshold Pro-Rata

The Threshold Pro-Rata algorithm (O) is an enhanced pro-rata algorithm that incorporates a priority (top order) to the first incoming order that betters the market. If priority is established, aggressor orders are first allocated to the top order up to the maximum configured priority allocation (volume cap). A minimum order size may also be set, whereas if an order does not meet that minimum level, it does not qualify for top order.

Additionally, there is a minimum configurable allocation parameter (pro-rata mini), which is set to a quantity that can be allocated due to the results from the initial pro-rated allocation. All fills are rounded down to the nearest integer and if an allocated trade quantity is less than the pro-rata min it is rounded down to zero.

Excess lots are allocated FIFO.

The Threshold Pro-Rata algorithm follows these stages to match trades:

- Assigns a top order percent allocation (with min and/or max)
- Pro-rata with configurable minimum allocation
- FIFO for any residual quantity

4.7.1.5 Threshold Pro-Rata with LMM

The Threshold Pro-Rata with LMM algorithm (Q) is an enhanced pro-rata algorithm that incorporates a Lead Market Maker (LMM) allocation after top order and before the pro-rata allocation.

LMM allows CME Group designated market makers to receive a designated allocation percentage of aggressor orders. The allocated quantity will not exceed the incoming order's quantity. Multiple LMM orders are matched based on FIFO rules until the incoming order's quantity is fulfilled or all LMM orders have received their allocated quantity.

Any remaining quantity is allocated pro-rata with configurable minimum allocation.

The Threshold Pro-Rata with LMM algorithm follows these stages to match trades:

- Assigns a top order percent allocation (with min and/or max)
- LMM set to configurable percent
- Pro-rata with configurable minimum allocation
- FIFO for any residual quantity

4.7.1.6 Split FIFO/Pro-Rata

The Split FIFO/Pro-Rata algorithm (K) is a hybrid which integrates a percent-based allocation on both a FIFO and Pro-Rata formula to the resting order book. This algorithm has been developed with the flexibility to calibrate the level of tradable quantity that is allocated on a FIFO and pro-rata basis (X% FIFO, Y% pro-rata for every tradable quantity).

Additionally, an order that does not receive an allocation during the Pro-Rata stage is eligible for a one lot fill through pro-rata leveling. The allocations for this component are prioritized for orders with the largest remaining quantity. If multiple orders have the same remaining quantity time priority will be the determining factor.

This algorithm can also incorporate a top order and LMM components before the FIFO and pro-rata allocations are calculated.

The Split FIFO/Pro-Rata algorithm follows these stages to match trades:

- Assigns a top order percent allocation (with min and/or max)
- LMM may be applied
- FIFO percent may be configured from 0 to 100%
- Pro-rata with min may be configured from 0 to 100%
- Pro-rata leveling
- FIFO for any residual quantity

4.7.1.7 NYMEX FIFO with LMM

The NYMEX FIFO with LMM algorithm (N) is an enhanced FIFO algorithm that allows for LMM allocations prior to the FIFO allocations. LMMs are allocated an aggregated configurable percentage of an aggressor order before the remaining quantity is allocated FIFO.

The NYMEX FIFO with LMM algorithm follows these stages to match trades:

- LMM set to configurable percent
- FIFO allocation

4.7.1.8 FIFO with LMM

The FIFO with LMM algorithm (T) is an enhanced FIFO algorithm that allows for LMM allocations prior to the FIFO allocations. LMMs are each allocated a configurable percentage of an aggressor order before the remaining quantity is allocated FIFO.

The FIFO with LMM algorithm follows these stages to match trades:

- LMM set to configurable percent
- FIFO allocation

4.7.1.9 FIFO with Top Order and LMM

The FIFO with LMM algorithm (S) is an enhanced FIFO algorithm that allows for LMM allocations prior to the FIFO allocations. Additionally, this algorithm incorporates a priority (top order) to the first incoming order that betters the market. If priority is established, the aggressor orders are first allocated to the top order until the order's quantity is exhausted.

The FIFO with LMM algorithm follows these stages to match trades:

- Assigns a top order percent allocation that betters the market
- LMM set to configurable percent
- FIFO allocation

4.7.1.10 Eurodollar Option

The Eurodollar Option algorithm (Y) is an enhanced pro-rata algorithm that incorporates an LMM allocation before top order and pro-rata allocations. Once each LMM has been allocated their configurable percent, and if priority was established that meets the minimum requirement of 50 lots, the remaining quantity of the aggressor order is allocated to the top order until that order's quantity is exhausted.

If no top order exists or there is remaining quantity from the aggressor order after the top order has been fulfilled, the remaining quantity will be allocated pro-rata.

The Eurodollar Option algorithm follows these stages to match trades:

- LMM set to configurable percent
- Assigns a top order percent allocation (25% with Min=50) that betters the market
- Pro-rata with minimum allocation of one lot
- FIFO for any residual quantity

CME Globex Matching Algorithms

CME Globex Matching Algorithms	
Algorithm	Fix Tag 1142 – Match Algorithm
First In, First Out (FIFO)	F
Pro-Rata	C
Allocation	A
Threshold Pro-Rata	O
Threshold Pro-Rata with LMM	Q
Split FIFO/Pro-Rata	K
NYMEX FIFO with Lead Market Maker (LMM)	N
FIFO with LMM	T
FIFO with Top Order and LMM	S
Eurodollar Options	Y

FIFO (First In-First Out) Algorithm (F)

The FIFO Algorithm (F) fills orders on a strict price/time priority; the first order at a price level is the first order matched.

Orders lose their priority and get re-queued if users:

- Increase the quantity
- Change the price
- Change the account number

Pro-Rata Algorithm (C)

The Pro-Rata Algorithm (C) fills orders according to price, order lot size, and time. An incoming aggressor order's quantity is multiplied by each resting orders pro-rated percentage to calculate allocated trade volumes. All fills are rounded down to the nearest integer and if an allocated trade volume is less than 1 it is rounded down to zero.

An order's Pro-Rata percentage is calculated by taking order quantity / total quantity at a certain price. Excess lots, which occur as a result of the rounding down of the original allocated trade volumes, are allocated FIFO.

The Pro-Rata Algorithm (C) uses the following stages of matching trades:

- Pro-Rata with Minimum Allocation of 1 lot
- FIFO for any Residual Volume

Allocation Algorithm (A)

The Allocation Algorithm (A) is an enhanced Pro-Rata Algorithm that incorporates a priority (top order) to the first incoming order that betters the market. If priority is established, the aggressor orders are first allocated to the top order until the order's quantity is exhausted.

Additionally, there is a minimum pro-rata allocation parameter of 2 lots. All fills are rounded down to the nearest integer and if an allocated trade volume is less than 2 lots it is rounded down to zero.

Excess lots are allocated FIFO.

The Allocation Algorithm (A) uses the following stages of matching trades:

- Assigns a top order Percentage Allocation
- Pro-Rata with Minimum Allocation of 2 lots
- FIFO for any Residual Volume

Threshold Pro-Rata Algorithm (O)

The Threshold Pro-Rata Algorithm (O) is an enhanced Pro-Rata Algorithm that incorporates a priority (top order) to the first incoming order that betters the market. If priority is established, aggressor orders are first allocated to the top order up to the maximum configured priority allocation (volume 'cap'). A minimum order size can also be set, whereas if an order does not meet that minimum level, it does not qualify for top order.

Additionally, there is a minimum configurable allocation parameter (Pro-Rata Min) which is set to a quantity that can be allocated due to the results from the initial pro-rated allocation. All fills are rounded down to the nearest integer and if an allocated trade volume is less than the Pro-Rata Min it is rounded down to zero.

Excess lots are allocated FIFO.

The Threshold Pro-Rata Algorithm (O) uses the following stages of matching trades:

- Assigns a top order Percentage Allocation (with Min/Max)
- Pro-Rata with configurable Minimum Allocation
- FIFO for any Residual Volume

Threshold Pro-Rata with LMM (Q)

The Threshold Pro-Rata Algorithm with LMM (Q) is an enhanced Pro-Rata Algorithm that incorporates a Market Maker (LMM) allocation after top order and before the Pro-Rata allocation.

LMM allows Market Makers to receive a designated allocation percentage of aggressor orders. The allocated quantity will not exceed the incoming order's quantity. Multiple LMM orders are matched based on FIFO rules until the incoming order's quantity is fulfilled or all LMM orders received their allocated volumes.

Any remaining volume is allocated Pro-Rata with configurable minimum allocation.

The Threshold Pro-Rata Algorithm with LMM (Q) uses the following stages of matching trades:

- Assigns a top order Percentage Allocation (with Min/Max)
- LMM set to configurable Percentage
- Pro-Rata with configurable Minimum Allocation
- FIFO for any Residual Volume

Split FIFO/Pro-Rata Algorithm (K)

The Split FIFO/Pro-Rata Algorithm (K) is a hybrid algorithm which integrates a percentage based allocation on both a FIFO and Pro-Rata formula to the resting order book. The algorithm has been developed with the flexibility to calibrate the level of tradable quantity that is allocated on a FIFO and Pro-Rata basis (X% FIFO, Y% Pro-Rata for every tradable quantity).

Additionally, an order that does not receive an allocation during the Pro-Rata stage is eligible for a 1 lot fill through Pro-Rata Leveling. The allocations for this component are prioritized for orders with the largest remaining quantity. If multiple orders have the same remaining quantity time priority will be the determining factor.

This algorithm can also incorporate a top order and/or LMM components before the FIFO and Pro-Rata allocations are calculated.

The Split FIFO/Pro-Rata Algorithm (K) uses the following stages of matching trades:

- Assigns a top order Percentage Allocation (with Min/Max)
- Market Maker (LMM) may be used in conjunction with this algorithm
- FIFO Percentage can be configured (0-100%)
- Pro-Rata with Min can be configured (0-100%)
- Pro-Rata Leveling
- FIFO for any residual volume

NYMEX FIFO with LMM (N)

The NYMEX FIFO Algorithm with LMM (N) is an enhanced FIFO algorithm that allows for LMM allocations prior to the FIFO allocations. The LMM (s) are allocated an aggregated configurable percentage of an aggressor order before the remaining quantity is allocated FIFO.

The NYMEX FIFO Algorithm with LMM (N) uses the following stages of matching trades:

- LMM set to configurable Percentage
- FIFO Allocation

FIFO with LMM (T)

The FIFO Algorithm with LMM (T) is an enhanced FIFO algorithm that allows for LMM allocations prior to the FIFO allocations. The LMM (s) are each allocated a configurable percentage of an aggressor order before the remaining quantity is allocated FIFO.

The FIFO Algorithm with LMM (T) uses the following stages of matching trades:

- LMM set to configurable Percentage
- FIFO Allocation

FIFO with Top Order & LMM (S)

The FIFO Algorithm with LMM (S) is an enhanced FIFO algorithm that allows for LMM allocations prior to the FIFO allocations. Additionally this algorithm incorporates a priority (top order) to the first incoming order that betters the market. If priority is established, the aggressor orders are first allocated to the top order until the order's quantity is exhausted.

The FIFO Algorithm with LMM (S) uses the following stages of matching trades:

- Assigns a top order Percentage Allocation that betters the market
- LMM set to configurable Percentage
- FIFO Allocation
-

The Eurodollar Option Algorithm (Y)

The Eurodollar Option Algorithm (Y) is an enhanced Pro-Rata Algorithm that incorporates a Market Maker (LMM) allocation before top order and the Pro-Rata allocation. Once each LMM (s) has been allocated their configurable percentage and if priority was established that meets the minimum requirement of 50 lots, the remaining volume of the aggressor order is allocated to the top order until the order's quantity is exhausted.

If no top order exists or there is remaining volume from the aggressor order after the top order has been fulfilled, that remaining volume will be allocated Pro-Rata.

The Eurodollar Option Algorithm (Y) uses the following stages of matching trades:

- LMM set to configurable Percentage
- Assigns a top order Percentage Allocation (25% with Min=50) that betters the market
- Pro-Rata with Minimum Allocation of 1 lot
- FIFO for any Residual Volume

4.7.2 Implied Functionality

An implied price is a futures order CME Globex identifies as existing in A) the spread market based on orders in the outright market (referred to as IMPLIED IN) OR, B) an order CME Globex identifies as existing in the outright market based on orders in the spread market (IMPLIED OUT).

The following examples showing how implied orders are constructed in one market based on orders in another.

4.7.2.1 Implied IN Orders

Implied IN spread orders derive from existing outright orders in individual legs. Below is an example for an implied bid in a spread (known as an implied IN order).

	QTY	BID	ASK	QTY
QMU1	15	74150		
QMV1			75500	10
QMU1-QMV1	10	-1350		

In this implied IN example, a quantity of 10 is available from the 15 bid in September 2011 (QMU1) to spread against the 10 bid in the October 2001 ask (QMV1) to create the two legs of quantity 10 in an implied bid for the Sept-Oct. 2001 spread (QMU1-QMV1).

4.7.2.2 Implied OUT Orders

Implied OUT outright orders are derived from a combination of an existing spread order and an existing outright order in one of the individual underlying legs. These two orders are used to create a contingent outright order on the other underlying leg of the spread. Below is an example for an implied bid in a leg (known as an implied OUT).

	QTY	BID	ASK	QTY
QMU1	15	74150		
QMV1	10	75500		
QMU1-QMV1			-1350	10

In this implied OUT example, the 10 quantity of the Sept-Oct. 2011 spread (QMU1-QMV1) to create bid for 10 contracts in the October 2011 outright (QMV1) implies a bid quantity of 10 in QMV1.

Because the CME Globex system can process orders sequentially in an entire group, both of these implied quotes can be displayed at the same time. If an order arrives to trade with one of the implied quotes, the executed trade will cause the other implied quote to be eliminated.

When an implied spread order is filled, multiple execution reports are returned to the client for each fill. One execution report is sent for the implied spread with the CME default account as the counterparty and one execution report is sent to each counterparty per leg in the spread.

4.7.2.3 Stop Limit Orders for Implied Eligible Instruments

The processing of stop-limit orders is slightly different for Implied-enabled instruments. After a stop-limit order is triggered, it is treated as a newly arriving limit order. It can be executed at all price levels better than or between the trigger and the limit prices. This behavior differs from the processing of non-implied instruments, which are executed only at price levels between the trigger and the limit prices.

4.7.3 Volatility Quoted Markets

Volatility quoted options provide users with implied annualized volatility-quoted markets on the CME Globex platform for options on Foreign Exchange (FX) futures. Volatility-quoting allows CME Globex users to trade options volatility with an 'auto-hedge' into the corresponding quarterly month of the underlying futures contract.

This functionality eliminates the volatility-to-premium conversion and constant price modification previously required to trade options volatility in premium markets. Additionally, the match and post-match efficiencies for client systems implementing volatility-quoting functionality mitigate underlying hedge price risk and, in most cases, ensure futures hedge quantity allocation.

Volatility-quoted markets are separate from premium markets and designated as such in market data messages. Products in volatility-quoted markets will be bid or offered in terms of annualized implied volatility to three decimal places and trade in increments of .025 of a vol (i.e., one percentage point of annualized implied volatility). The order book for any given strike price will be represented by quantity and volatility as shown below.

900 Call / Currency Options			
Bid		Ask	
Quantity	Volatility	Volatility	Quantity
90	8.150	8.175	100
50	8.125	8.200	50
20	8.100	8.225	20

4.7.3.1 Hedge Assignment

Following the volatility-quoted options match, CME Globex performs pricing and hedge quantity assignment as follows:

1. Determine the hedge quantity for the volatility match.
2. Determine the option premium price using the following variables applied in the appropriate options pricing model:
 - matched implied volatility
 - underlying futures price*
 - time to expiration
 - option strike

- interest rate**
- call/put
- option style (European or American)

*The most liquid front month future is used to calculate all underlying futures prices used for hedging. This calculation is direct for options delivering into this front month futures contract. For all options delivering into back month futures, CME Globex uses the mid-market price of the front month contract and adds or subtracts the appropriate spread to produce a synthetic value for the back month underlying futures contract. The spread used in this computation will be the closing value for this particular spread as of the prior trading day. Also, during expiration week of the front month future, CME Globex compares the Bid/ Ask spread of the front month future against the next quarterly and uses the instrument with the tightest Bid/Ask spread as the basis for calculating the underlying futures price.

**This value is 100 minus the previous day's settlement price of the front month Eurodollar future until LTD. It then rolls to the next front month contract.

1. Determine the future hedge quantity by multiplying the matched volatility option quantity by the associated delta value for the option.
2. Determine futures price. Price is based on the midpoint of the most recent Bid and Ask spread of the future.
 - If the midpoint is not on-tick, CME Globex rounds to the side with the smallest quantity.
 - If no resting Bid/Ask spread is available, CME Globex uses the last traded price.
 - If no traded price is available, the previous day's settle is used.

Notes:

- When performing the volatility to premium conversion, CME Globex uses an additional decimal place to allow for greater rounding precision.
 - Only one futures product is supported for the futures hedge.
 - It is possible for a volatility match to occur without a futures hedge if the total calculated futures hedge ratio per buy/sell match is between + 0.50 and - 0.50. In either instance, the futures hedge rounds to zero.
-

4.7.3.2 Hedge Assignment with Multiple Counterparties

The matched quantity is a 10-lot and its corresponding delta is 0.04. The product of these two multiplied factors equates to a futures hedge ratio of 0.40 (10-lot * 0.04 delta). The hedge ratio equals zero futures since the hedge ratio is rounded toward zero.

CME Globex does not send an Execution Report for a futures hedge when the quantity rounds to zero. The delta for the futures hedge is sent in the Execution Report (tag 35-MessageType=8) Fill message for the option premium outright instrument(s) in tag 811-OptionDelta.

Example

If a single volatility match has multiple counterparties, then the incoming futures hedge ratio is determined for the entire incoming order. The futures hedge ratio for each counterparty is determined individually for each resting order.

The following example is for a European-style option:

1. Assume the Ask side order enters the market and sweeps the Bid side quantity.

1.7000 Call / Currency Option\$			
	BID	ASK\$	
QTY\$	Volatility	Volatility\$	QTY\$
40\$	1220	1220\$	100\$
30\$	1220		(incoming order)\$
20\$	1220		
10\$	1220		

- Black's model outputs a computed delta of 0.51.
- The breakdown for hedge ratios is as follows

Bid QTY\$	Delta\$	Assigned Hedge Ratio\$	Ask QTY\$	Delta\$	Assigned Hedge Ratio\$
40\$	0.51\$	21\$			
30\$	0.51\$	15\$			
20\$	0.51\$	10\$	100\$.51\$.51\$
10\$	0.51\$	5\$			
\$		51\$			

INOF = Incoming Number of Futures

RNOF = Resting Number of Futures

Explanation:

The resting 40 lot had a total delta of 20.4

The resting 30 lot had a total delta of 15.3

The resting 20 lot had a total delta of 10.2

The resting 10 lot had a total delta of 5.1

INOF/RNOF methodology dictates that INOF must = RNOF

To have INOF=RNOF, CME Globex distributes the leftover futures from INOF to the least allocated RNOF, 1 lot at a time. Therefore, the resting 40 lot will receive the leftover 1 lot since it was the least allocated RNOF.

This rule ensures that an incoming order is never uncovered by more than 0.50 futures. Also, the resting orders are never uncovered/over covered by more than 0.99 futures.

4.7.3.3 Position Management

Volatility trades will not create separate volatility positions in CME Clearing but will be added to the position aggregate for the premium instrument.

4.7.4 Spread Trade Execution Reports

For all spread trades, CME Globex sends the client system that submitted the order an Execution Report for the spread instrument and for each leg instrument. To enable client systems to link the spread instrument with each component leg, the Execution Report - Fill message implements the following tags:

- Tag 393 - TotalNumSecurities - contains the number of Fill messages sent for the spread minus the spread summary. This tag is applicable for covereds and vol-quoted options. This is sent only in the spread Execution Report.
- Tag 527 - SecondaryExecID - unique identifier associated with the spread trade and allows the client system to link leg fills and trade cancellation notices to the original spread transaction. This value is unique per instrument per trade per trading session.

4.7.4.1 Execution Report – Spread Trade Cancellation

When a spread trade is busted, CME Globex sends the Execution Report - Trade Cancellation message (tag 35-MessageType=8, tag 39-OrdStatus=H) for legs only. Client systems can correlate tag 527-SecondaryExecID for each leg of the busted trade with tag 527 in the spread instrument Execution Report Fill message as shown in the following diagram:

5 Request for Quote (RFQ)

Quote Request functionality enables CME customers to request a quote (submit RFQ) with one or both sides.

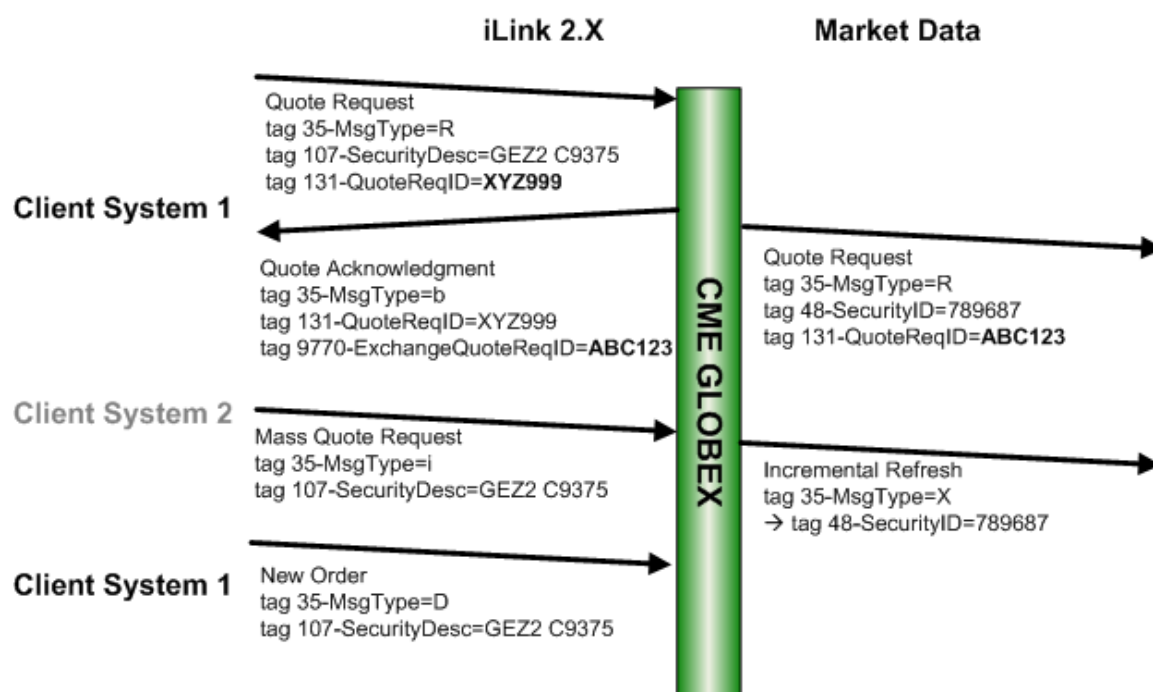
The quote request is disseminated with the market data Request for Quote message at which point market participants can respond with an order. CME Group authorized Market Makers can respond to the quote request with two-sided markets for the instrument.

An RFQ notifies market participants of a specific instrument that a price is required for the market. The RFQ must specify the quantity for which a price is required.

CME Globex broadcasts the market data to all users identifying the quotes that have been added to the order book.

The Quote Acknowledgment message is sent from CME Globex to the trader in response to a Quote Request. The Quote Acknowledgment can be either positive (the quote request was accepted) or negative (the quote request was rejected).

CME Group encourages customers to have a broad awareness of trading opportunities and not restrict their view to specific instruments and strike prices. CME strongly recommends that customer trading applications receive and broadcast all Request for Quote messages for all traded instruments for end-user display in a single viewer.



6 Theoretical Opening Price

The Theoretical Opening Price provides market participants with a probable price at which the market will open or re-open, given the current book and order activity.

The Theoretical Opening Price is calculated by the trading engine during the Pre-Open and Reserve States based on the orders in the book. During these two states orders can be entered or modified, but no matching will occur. This can cause the order book to be locked or crossed which would produce a Theoretical Opening Price.

Theoretical opening details are published using the Market Data Incremental Refresh tag 35-MsgType=X Message, Book Update Data Block and Opening Data Block. These messages are used to inform users of updates to the book and the Theoretical Opening Price.

The Market Data Incremental Refresh tag 35-MsgType=X Message, Opening Data Block carries the Theoretical Opening Price and is published during the Pre-open State and Reserve State. The Market Data Incremental Refresh tag 35-MsgType=X Message, Opening Data Block is sent when:

- A new order is entered that changes the Theoretical Opening Price
- A book update changes the Theoretical Opening Price

The Market Data Incremental Refresh tag 35-MsgType=X Message, Book Update Data Block is published to inform users of the limit prices available in the order book. It is sent when:

An inbound order or modification changes the prices or quantities of the bid or ask price levels.

A cancel removes orders from the bid or ask price levels

Tag 346-NumberOfOrders included in the Theoretical Opening Price shows only the Displayed (booked) quantity on the Market Data Incremental Refresh tag 35-MsgType=X Message, Book Update Data Block even though the Theoretical Opening Price was calculated using the entire order size for the Display Quantity Order.

The order quantities and the instrument quantities for elected Stop Orders with the highest price (if they are buy Stops) or the lowest price (if they are sell Stops) are shown on the Market Data Incremental Refresh tag 35-MsgType=X Message (only 1 Stop order is shown regardless of how many Stops were elected by the Theoretical Opening Price)

Theoretical Opening Prices are only calculated for outright futures, futures spreads, options strategies, and options series.

6.1 *Calculating / Determining the Theoretical Opening Price*

CME Globex follows a specific set of rules to determine the Theoretical Opening Price:

Rule 1: Determine the maximum matching quantity at a price level

Rule 2: Determine the minimum non-matching quantity

Rule 3: Determine the highest price if non-matching quantity is on the buy side for all prices

Rule 4: Determine the lowest price if non-matching quantity is on the sell side for all prices

Rule 5: Determine the closest price to the settlement price (reference price)

Rules are applied in a hierarchy from Rule 1 through Rule 5. The Theoretical Opening Price is determined by whichever rule best applies to the order book at that moment.

6.1.1 Stop Orders in Theoretical Opening Price

After a Theoretical Opening Price is calculated the Stop book is scanned for Stops that would be elected by the Theoretical Opening Price. All Stops that would be elected by the Theoretical Opening Price are added to the limit book and the Theoretical Opening Price is recalculated.

6.1.2 Determining Cumulative Quantity

The Theoretical Opening Price is established by determining which price will match the most instruments based on the current mix of bids and offers available in the order book. CME Globex examines all prices where Bids and Offers overlap. The Bid and Offer quantity available at each price in the overlapped price level is listed and the cumulative quantity total of all bids and offers is determined at each price.

Bid cumulative quantity is determined by summing the bid quantity at each price, starting from the highest price and cumulating down to the lowest price level. Offer cumulative quantity is determined by summing the offer quantity at each price, starting from the lowest price and cumulating up to the highest price level.

Cumulative Total of Bids and Offers				
Cumulative Sum of Bids	Bid Quantity	Price	Ask Quantity	Cumulative Sum of Offers
10	10	51	30	357
30	20	50	100	327
60	30	49	1	227
100	40	48	25	226
150	50	47	1	201
220	70	46	100	200
320	100	45	90	100
321	1	44	4	10
351	30	43	6	6

6.1.3 Examining the Theoretical Opening Price

Once the cumulative quantities available at each price are established, each price can be examined to determine where the most instruments can be matched.

The reasoning behind this comparison is that at each price level, all cumulative bids can be matched at that price or better and all cumulative offers can be matched at that price or better.

For example, if a match is executed at price level 43, bids at 44 through 51 could also potentially be matched. The opposite is true for offers. If a match is executed at price level 51, offers at 50 through 43 could also potentially be matched.

- At price level 48, there are 100 cumulative bid instruments available and 226 cumulative offer instruments available. A match at price 48 would execute 100 leaving a quantity of 126 offer instruments remaining on the book at the moment of the market opening.
- At price level 47, there are 150 cumulative bid instruments available and 201 cumulative offer instruments available. At price level 47, the result would be 150 instruments executed.
- At price level 46, there are 220 cumulative bid instruments available and 200 cumulative offer instruments available. At price level 46, the result would be 200 instruments executed.
- At price level 45, there are 320 cumulative bid instruments available and 100 cumulative offer instruments available. At price level 45, the result would be 100 instruments executed.

The Theoretical Opening Price would be price level 46 where the maximum quantity of 200 instruments could be matched

6.1.4 Applying the Rules to Establish the Theoretical Opening Price

Rule1: Determine the maximum matching quantity at a price level.

Maximum Matching Quantity				
Cumulative Sum of Bids	Bid Quantity	Price	Ask Quantity	Cumulative Sum of Offers
10	10	51	30	357
30	20	50	100	327
60	30	49	1	227
100	40	48	25	226
150	50	47	1	201
220	70	46	100	200
320	100	45	90	100
321	1	44	4	10
351	30	43	6	6

Note: Executed Quantity = 200

The largest cumulative quantity of bids and offers that can be executed is at the price level of 46. The 200 offer instruments can be matched with the 220 Bid instruments available providing the greatest number of instruments matched of 200. So, the Theoretical Opening Price is 46.

If rule 1 does not produce a Theoretical Opening Price then include rule 2

Rule 2: Determine the minimum non-matching quantity.

Minimum Non-Matching Quantity				
Cumulative Sum of Bids	Bid Quantity	Price	Ask Quantity	Cumulative Sum of Offers
10	10	51	30	306
30	20	50	100	276
60	30	49	1	176
100	40	48	25	175
150	50	47	0	150
180	30	46	50	150
280	100	45	90	100
281	1	44	4	10
311	30	43	6	6

Note: Executed Quantity = 150

At price levels of 46 and 47 there is a tie for the number of instruments that can match, 150 at each price level. At price level 47, the non-matching quantity is 0 (150 Bid - 150 offer = 0). At price level 46, the non-matching quantity is 30 (180 Bid - 150 offer = 30). So, the Theoretical Opening Price is 47, where there is the least number of unmatched instruments.

If rules 1 and 2 do not produce a Theoretical Opening Price, then include rule 3.

Rule 3: Determine the highest price if the non-matching quantity is on the buy side for all prices.

Highest Price

Cumulative Sum of Bids	Bid Quantity	Price	Ask Quantity	Cumulative Sum of Offers
10	10	51	30	306
30	20	50	100	276
60	30	49	1	176
100	40	48	25	175
180	80	47	0	150
180	0	46	50	150
200	20	45	90	100
230	30	44	4	10
260	30	43	6	6

Note: Executed Quantity = 150

At price level 47, the largest cumulative quantity of Bids is 180. The largest cumulative quantity of offers is 150. The number of instruments that can match at price 47 is 150 instruments. The remaining non-matching Bid instruments = 30 (180 Bid - 150 offer = 30).

At price level 46, the largest cumulative quantity value of Bids is 180. The largest cumulative quantity of offers is 150. The number of instruments that can match at price 46 is 150 instruments. The remaining non-matching Bid instruments = 30 (180 Bid - 150 offer = 30).

The Theoretical Opening Price is 47, which is the highest price where the unmatched instruments are Bid instruments.

Rule 4: Determine the lowest price if the non-matching quantity is on the sell side for all prices.

Lowest Price				
Cumulative Sum of Bids	Bid Quantity	Price	Ask Quantity	Cumulative Sum of Offers
10	10	51	30	306
30	20	50	100	276
60	30	49	1	176
100	40	48	25	175
110	10	47	0	150
110	0	46	50	150
130	20	45	90	100
160	30	44	4	10
190	30	43	6	6

Note: Executed Quantity = 110

At price level 47, the largest cumulative quantity of Bids is 110. The largest cumulative quantity value of offers is 150. The number of instruments that can match at price 47 is 110 instruments. The remaining non-matching quantity is 40 (150 offer - 110 Bid = 40).

At price level 46, the largest cumulative quantity value of Bids is 110. The largest cumulative quantity value of offers is 150. The number of instruments that can match at price 46 is 110 instruments. The remaining non-matching quantity is 40 (150 offer - 110 Bid = 40).

The Theoretical Opening Price is 46, which is the lowest price where the unmatched instruments are Offer instruments.

If rule 3 and 4 have a tie then include rule 5.

Rule 5: Determine the closest price to the settlement price (reference price).

Closest Price to the Settlement Price (Reference Price)				
Cumulative Sum of Bids	Bid Quantity	Price	Ask Quantity	Cumulative Sum of Offers
50	50	51	30	280
70	20	50	100	250
150	80	49	0	150
150	0	48	0	150
150	0	47	0	150
150	0	46	0	150
150	0	45	70	150
150	0	44	60	80
150	0	43	20	20

Note: Executed Quantity = 150

Settlement Price (Reference Price) = 46

At price levels 45 through 49, matches can occur at the calculated maximum number of 150 instruments. Each price level shows accumulated totals of 150 Bids and 150 Offers which when matched results in zero remaining instruments. Theoretical Opening Price is the price closest to settlement

6.1.5 Stops in Theoretical Opening Price

After a Theoretical Opening Price price is calculated, the Stop Order book is scanned to determine if the Theoretical Opening Price elects any Stop Orders. If the Theoretical Opening Price would elect Stop Orders then recalculate the Theoretical Opening Price including the quantities at the limit price of the Stop Orders that would be elected (this process continues until no other Stop Orders are elected by a Theoretical Opening Price).

6.1.6 Display Quantity Orders in Theoretical Opening Price

If a Display Quantity order is on the book while the Theoretical Opening Price is being calculated then the entire order size (not just the displayed (booked) quantity) is included in the calculation.

7 Settlement Price

This section describes the types of settlement prices disseminated for products on the CME Globex platform.

Settlement is an official CMEG price established at the end of each trading day for each instrument available on CME Globex. This price is used to determine margin requirements and the following day's price limits. Depending upon instrument characteristics and market activity, settlement price will be one of the types described below.

7.1 Preliminary Settlement Price

Calculated based on market activity on all trading venues during a predetermined time range. Available at: <http://www.cmegroup.com/market-data/settlements/settlements-details.html>

- Disseminated early Monday thru Friday, to allow customers to prepare for the opening of the next trading day.
- May be Actual or Rounded.

Preliminary Settlement Price Example

- S&P 500 future ticks at .10
- E-mini S&P 500 future ticks at .25
- The preliminary settlement price for the E-mini S&P 500 is based on the activity in the S&P 500
 - S&P 500 sends an Actual preliminary settlement price at 1225.30
 - E-mini S&P 500 sends an Actual preliminary settlement price at 1225.30
 - E-mini S&P 500 sends a Rounded preliminary settlement price at 1225.25 (rounded to the nearest on-tick price)

7.1.1 Actual Preliminary Settlement Price

- Price is based on market activity for that instrument (trades, bids, and offers) during a pre-determined time range.
- An actual preliminary settlement price is disseminated for all instruments that have had activity during the trading day, a prior day's settlement, or have open interest.

7.1.2 Rounded Preliminary Settlement Price

- Price is based on another instrument's activity (trades, bids and offers) during a predetermined time range.
- Only sent for instruments whose preliminary settlement price is based on another instrument's activity AND the other instrument has a different tick interval (e.g., e-mini, e-micro, and miNY products are settled to their corresponding full-sized product).

7.2 Final Settlement Price

Final settlement price is the official daily settlement published by CME Clearing and disseminated after the start of the next trading day on CME Globex, Sundays starting at 1:00 pm CT, Monday through Thursday, between 7:00 p.m. and 9:30 p.m. CT.

Note: this price may be Theoretical.

7.2.1 Final Theoretical Settlement Price

Final theoretical settlement price is calculated by CME Clearing and only sent in the scenario in which an actual final settlement price cannot be determined for an instrument due to the following conditions:

- Only sent when a settlement price cannot be determined because the instrument has
 - had NO activity during the trading day
 - had NO prior day's settlement price
 - had NO open interest

Note: All three criteria above must be met for a price to be defined as Theoretical Final.

8 Market Integrity Controls

CME Globex employs several mechanisms to ensure market integrity and the ability for the market to maintain soundness and adherence to the CME Group Exchange trading policies. These market controls include:

- Order Activity Restrictions
- Daily Price Limits
- Price Banding
- Trade Cancellation Policy
- Stop Spike Logic

8.1 Market States and Order Activity Restrictions

The CME Globex Trading Day proceeds through distinct periods, known as market states, during which defined types of activity are allowed to take place to ensure market integrity. Market states are managed by CME Globex administration.

Market State	Description
Price Indication	Start of Communication Inquiries. No cancels, modifies, or order entry allowed.
Pre-Open	Earliest phase of Opening market state. Order Entry, modification, and cancel are allowed. No order matching
No Cancel	End of pre-open stage. Order entry is allowed. Modification and cancellation are not allowed.
Ready to trade/Start of Session	Start of continuous trading phase Period where pre-open orders are resolved following Theoretical Opening Price determination. Order matching begins.
Unknown or Invalid	Start of interruption of continuous trading for one or more instruments.
Trading Halt	Interruption of continuous trading and the period during which only order cancellation is allowed and order matching is not allowed
Not available for trading/End of session	End of communication. Order entry, modification, and cancellation are not allowed.
Not available for trading	End of day preparation for the next pre-open.

8.2 Daily Price (Trading) Limits

Daily price limits for trading in futures and daily price limits (circuit breakers) for trading energy and equities instruments are established by CME Group. The price limits are stated in terms of the previous or prior settlement price plus or minus the specific trading unit limit. Circuit breakers allow for normal limits to be expanded by a specific amount. Circuit breakers are re-assessed quarterly rather than established at fixed levels insofar as fixed limits are not responsive to on-going market fluctuations.

Price Limits refer to a high or low price limit assigned to a given instrument. It is a precautionary measure assigned by CME Globex to prevent abnormal market movement. Price limits exist on all futures products except the currencies and are set based on product specifications.

Once a futures price has increased by its daily limit, there can be no trading at any higher price until the next day of trading. Conversely, once a futures price has declined by its daily limit, there can be no trading at any lower price until the next day of trading.

Therefore, if the daily limit for a particular grain is currently 10 cents a bushel and the previous day's settlement price was \$3.00, there cannot be trading during the current day at any price below \$2.90 or above \$3.10. The price is allowed to increase or decrease by the limit amount each day.

Price limits are scheduled to change three times per day from Sunday Start-up to Friday Market Close. After each trading session, the price limit's are adjusted based on the prior trading session's settlement price.

8.3 Price Banding

To ensure a fair and orderly market, CME Globex has also instituted a price banding mechanism where all incoming electronic orders are subject to price verification and all orders with clearly erroneous prices are rejected. Price banding on the CME Globex platform is designed to mitigate the impact of erroneous order entries.

An overly aggressive erroneous order, such as limit bids at prices well above the market or limit offers at prices well below the market, can trigger a sequence of market-moving trades that require subsequent cancellations.

CME Globex uses one mechanism for futures price banding and another mechanism for options price banding. Price banding is applied to each CME Globex product individually. A complete list of banding information for each electronically traded product is found on the CME Group website at: <http://www.cmegroup.com/globex/files/PriceBanding.pdf>.

Price banding represents a function of CME Globex which is applied to examine price-based orders before acceptance on the system. Specifically, banding is Globex logic which scans price-based orders, rejecting any buy orders above the "CME Last Price" PLUS a fixed band value or, any sell orders below the CME Last Price MINUS a fixed band value. The Last Price is determined by the last transaction, or the best bid or best offer through the last transaction. Alternatively, the Last Price can be determined by the Settlement Price, if no other prices are available.

Note: In implied markets, the Last Price can be determined by the implied better bid or implied better offer.

Banding does not prevent traders from entering bids below the market or entering offers above the market. It does not restrict how far below or above the market a trader may wish to trade. Banding does not hinder the market's depth in any way. Price Banding only prevents a trader from bidding or offering at prices that appear to be unrealistic and potentially damaging to the marketplace.

Price Banding will not "lock-up" the market in the event of a rapid decline or advance in prices. The price band is based on the last traded price or the best bid or offer. As such, the band is moved by the action of entering bids or offers beyond the most recent last traded price or the best bid or offer.

Although banding does not prevent order entry, for products with price limits or circuit breakers, order entry may be prevented by the price limits or circuit breakers which take precedence over price banding.

8.3.1 Price Banding with Market Limit Orders

Banding does not affect market orders so the price banding logic will not prevent the entry of market orders. A market order only has the potential to match the market price to the best bid or offer in the book but not beyond.

To illustrate this point, consider the entry of a 100-lot market limit order to buy when the book is configured as shown below:

Bid Quantity	Price	Offer Quantity
	150.75	300
	150.50	100
	150.25	50
	150.00	25
35	149.75	
60	149.25	
75	149.00	
25	148.75	

The immediate effect of the 100-lot market order to buy is that the order will be filled for 25 instruments at a price of 150.00. The unfilled 75 buy orders are converted by the trading host into a 75-lot limit bid at 150.00. As such, a market buy or sell order does not push the book past the current best bid or offer, respectively.

Banding will protect for the conversion of market orders into limit orders outside of the host at prices that would run through the book. An order under those conditions would be rejected.

8.3.2 Price Banding with Stop Orders

Stop orders are processed relative to the price banding parameters. If the buy (sell) price is farther from the trigger price than the banding parameter then the order is rejected. Therefore, for all accepted Stop orders, if the stop price is hit, the limit order will be at a price within the band.

8.3.3 Price Band Variation (PBV)

Based on the market state and trading activity, a Price Band Variation (PBV) will be applied above and below the instrument's reported reference price to establish the Price Band Variation Range (PBVR). The PBV is a static value that varies by product. It is symmetrically applied at both the upside (for bids) and downside (for offers) levels with each price change and enforced during the trading session.

If market conditions dictate a wider price band, for example, in a volatile market where prices are fluctuating rapidly, CME Group may elect to temporarily relax or suspend the price banding restriction. In addition to the PBVR, Daily Trading Limits may be in effect for certain products. Daily Trading Limits are always given priority over PBVR in rejecting orders with erroneous prices. PBVR are monitored throughout the day by the CME Global Control Center (GCC) and may be adjusted if necessary.

It is important to note that the Daily Trading Limits always take precedence over PBVR in rejecting orders with erroneous prices. Price bands are monitored throughout the day by the CME Global Control Center (GCC) and are adjusted when necessary.

8.4 Futures Banding

With each price change the PBVR is recalculated and the new range is applied. The CME Globex platform rejects all bids and offers outside the PBVR. Applying the PBV to a reference price determines the PBVR. The reference price used depends on the market state and trading activity:

- The instrument's Settlement Price will serve as the PBVR reference price during the Pre-Open and the Pre-Open/No-Cancel period, until the Theoretical Opening Price is calculated.
- Once a Theoretical Opening Price is established, the Theoretical Opening Price becomes the PBVR reference price.
- During the continuous trading, the CME Globex Last Price serves as the reference price for the PBVR.
- If an instrument has transitioned to continuous trading with no Theoretical Opening Price or CME Globex Last Price being established, then the Settlement Price will continue to serve as the PBVR reference price until a CME Globex Last Price is established.
- In the event of a market emergency where a market is placed in a non-trading mode after continuous trading has begun, then the Theoretical Opening Price will serve as the PBVR reference price during the non-regular Pre-Open and the Pre-Open/ No-Cancel Period. If no Theoretical Opening Price is available, then the CME Globex Last Price will serve as the PBVR reference price.

The PBVR adjusts dynamically as the CME Globex Last Price changes for a given product.

Example: PBVR Adjustment

Assume: PBV for an index product is 100.00 index points

CME Globex Last Price for the product is 3000.00

PBVR would span from 2900.00 to 3100.00

All bids above 3100.00 and all offers below 2900.00 would be rejected by the CME Globex matching engine. If a CME Globex Last Price of 3010.00 is established, the PBVR is dynamically adjusted to span from 2910.00 to 3110.00

8.5 Options Banding

Price Banding for options markets requires specific considerations.

Although a series of options on a particular futures instrument may trade frequently, any single specific strike price option may not trade or even be quoted regularly. The price of the underlying futures instrument may change substantially relative to the option's CME Last Price, causing the market value of a formerly out-of-the-money option to increase substantially while the PBVR is locked in place.

The CME Last Price on a specific option is an unrepresentative reference price. In addition, options with different strikes require different price band widths. PBVRs for "out-of-the-money" options should be narrower than those for "in-the-money" options to reflect the differences in the extent to which bids and offers departing from their fair market value may be considered erroneous.

For these reasons, CME Group has instituted enhanced options price banding, a dynamic price banding system, for selected options and options strategies traded on the CME Globex platform.

Enhanced Options price banding is identical to futures price banding, with the following modifications. Based on market conditions, the reference price is set to either the:

- Last Price of the option or spread
- Theoretical Options Price, based on well established options pricing algorithms
- Last Price in combination with the Theoretical Options Price, if practical.

The width of the price bands is determined by one either a Fixed PBV for the entire option series, identical to the price banding for futures practice or a Dynamic PBV based on the delta of the option, as estimated by the Theoretical Options Price calculation or a Dynamic PBV based on a percentage of the Theoretical Options Price, where the percentage is based on the delta of the option.

8.6 Trade Cancellation

8.6.1 GCC Trade Cancellation Policy

CME and CBOT Rule 588, which are identical, each state that trade prices which occur within the No Trade Cancel Range, as determined by the Global Control Center (GCC), will generally not be cancelled or adjusted. The only exception to this rule is when the GCC determines that allowing a trade to stand as executed may have a material, adverse effect on the integrity of the market.

The GCC may review a trade based on its analysis of market conditions or a request for review by a CME Globex user. A request for review must be made as soon as possible, but will generally not be considered **if more than eight minutes have passed** since the trade occurred. The GCC also has the authority, but not the obligation, to review trades reported more than one hour following execution if it determines that the trade price was egregiously out of line with fair value.

A party responsible for an order(s) which results in a trade price adjustment or a trade cancel may be liable for actual losses incurred by affected parties pursuant to the criteria outlined in Rule 588. The No Trade Cancel Ranges for all products trading on CME Globex are set forth in both CME and CBOT Rule 588.

8.6.2 No Trade Cancel Range – Trade Cancellation

The Globex Trade Cancellation policy is applied to balance the adverse effects on market integrity of executing trades and publishing trade information inconsistent with prevailing market conditions. The intent is to preserve legitimate expectations that executed transactions will not be cancelled.

A No Trade Cancel Range is established for each Product available on CME Globex.

Trade prices that occur within the no trade cancel range, as determined by the CME Globex Control Center (GCC), will not generally be cancelled or adjusted. The only exception to this rule is if the GCC determines that not canceling or adjusting a trade within the no trade cancel range will have a material, adverse effect on the market

The Exchange's trade cancellation policy authorizes the Globex Control Center (GCC) to adjust trade prices or cancel trades when such action is necessary to mitigate market disrupting events caused by the improper or erroneous use of the electronic trading system or by system defects.

The decision of the GCC shall be final.

8.6.3 Review of Trades

The GCC may review a trade based on its analysis of market conditions or a request for review by a user of the electronic trading system. A request for review must be made within eight minutes of the execution of the trade. The GCC shall promptly determine whether the trade will be subject to review, and upon deciding to review a trade, the GCC will promptly issue an alert indicating that the trade is under review.

In the case of illiquid instruments, the GCC may initiate a review up to one hour after the execution of the trade, and has the authority, but not the obligation, to review trades reported more than one hour following execution if it determines that the trade price was egregiously out of line with fair value.

More detailed information on trade cancellation can be found in the [CME Globex Rulebook](#).

8.6.4 GCC Trade Cancellation

If CME Global Control Center (GCC) cancels a trade, the client application receives an Execution Report containing the following information:

- Order status is set to 'H' for trade cancelled
- Execution Type is set to 'H' for trade cancelled
- Execution Reference ID containing the Trade Number for the trade being cancelled; the Trade Number as originally contained in the Execution ID of the trade being cancelled. The Execution Reference ID in the trade cancellation notice identifies the specific cancelled trade.
- Last Shares value is set to the quantity of the trade that is being cancelled

Prior to a trade cancellation, each client involved in the trade has already received an Execution Report - Fill containing an identifier for the Execution report and information on when the order was accepted.

The characters following "TN" in the Execution ID are called the Trade Number. This number is used to identify the trade.

8.7 Stop Spike Logic

In highly volatile markets, the market bid and ask can have significant price changes. These price swings can result from market conditions, but can also be generated as a result of cascading stop price orders. Cascading Stop Orders is a condition triggered by a spike in the market prices that triggers stop orders which in turn causes the market to trigger still other stop orders and inappropriately moving the market.

Stop Spike Logic is designed to prevent excessive, improper price movements.

The stop price logic detects market movement due to the triggering, election, and trading of stop price orders. When this situation causes a secondary condition where the market triggers and trades additional stop price orders at extreme market prices the Stop Spike Logic is engaged. A typical situation would be when initial triggered stops would cause the market to trade outside predefined values (typically the same as the No Trade Cancel Ranges).

The method that is used by the Stop Spike Logic is to introduce a momentary pause in matching using the Reserved State. This momentary pause allows new orders to be entered and matched against the triggered stops in an algorithm similar to market opening.

Allowing the user community this momentary opportunity to enter, modify or cancel orders in this situation provides the ability to re-establish the proper market prices. The FIX/FAST Security Status (tag 35-MsgType=f) message is used to communicate the instrument status during the stop price logic process.

The following examples describe the stop price logic process and the use of the Security Status (tag 35-MsgType=f) message.

8.7.1 Market Is Open

When a stop price order is triggered and enters the market at the limit price, the stop price logic is activated. The execution price generated by the stop price order is compared against the last traded price plus/minus the product no trade cancel range. If the execution price is within the range, normal stop processing occurs and market remains open.

8.7.2 Market Is Reserved

If the execution price is outside the product no trade cancel range, the instrument is placed in reserved state for a predetermined amount of time. A Security Status (tag 35-MsgType=f) message is generated to notify market of this state.

Note: When the market is in a reserved state, any external event, such as market close or manual market intervention, will cause the market to transition from the reserved state and proceed with processing of the external event.

8.7.3 Market Reserved Activities

While the market is in a reserved state:

- A timer is activated that determines the length of time the market will be in reserved state. Time may vary.
- A counter is activated that counts the number of times the Theoretical Opening Price verification will be performed.
- An expanded price range is determined for verification of the Theoretical Opening Price value.
- When time has elapsed, verification is performed on the current Theoretical Opening Price. If the Theoretical Opening Price is inside the new expanded no trade cancel range, the market reopens. The Theoretical Opening Price is communicated via the Theoretical Opening Price data block (tag 35-MsgType=X, tag 269-MDEntryType=4, tag 286-OpenCloseSettleFlag=5).

8.7.4 Market Reopens

The FIX/FAST Security Status (tag 35-MsgType=f) message is generated.

If the Theoretical Opening Price is outside the new expanded range, the instrument remains in the reserved state for another time interval and the Theoretical Opening Price verification is performed again. This process continues until either the market is adjusted within the Theoretical Opening Price range or the predefined maximum number of iterations has been performed.

While the options market is in the Pause state, clients can cancel resting orders. No other actions are allowed.

During the 'Pause' state CME Globex cancels all options quotes. Once the futures Stop Spike event has been resolved, the options market transitions from 'Pause' to 'Open' with no indicative opening price; price discovery occurs via market maker quote submission.

9 Making Options Markets on CME Globex

A Market Maker is permitted to quote both a buy and a sell price in a given market. Market Makers add to the liquidity and depth of the market by taking a long and/or short positions.

CME Globex provides extra functional capability to options market makers via several order types and processes. This support includes:

- Mass Quote
- Quote Modify
- Quote Cancel
- Request for Quote (RFQ)
- Lead Market Maker (LMM) Matching

9.1 *Mass Quote*

Mass Quoting allows Market Makers to create and maintain a market on a large number of instruments simultaneously.

Mass Quote messages are accepted only during the Continuous Trading market state. All resting quotes are cancelled during post-session processing.

Mass Quoting allows Market Makers to:

- Create and update their position on up to 100 instruments utilizing a single message.
- Cancel all active quotes across all instruments, cancel all active quotes within one Product group, or cancel a list of specific quotes by submitting a single message.
- Utilize Market Maker protection to eliminate positions upon logout, disconnect, or trading activity exceeding predefined parameters

Only CME Group designated Market Makers are given permission to submit Mass Quote messages for designated products at the Product group level (i.e., E-mini S&P outright options). Market Makers cannot submit quotes for futures via this options path. Mass Quote messages from other market participants are rejected.

A Mass Quote message can only contain quotes for instruments belonging to the same Instrument group Code. The instrument group of the Mass Quote message is determined by the first quote of the message. The CME Globex platform rejects all quotes belonging to a different instrument group than that defined in the initial quote in the message.

If a Market Maker submits a Mass Quote with several quotes on the same instrument, only the first quote is accepted. All other quotes are rejected.

A Market Maker can only have one active resting quote per instrument

If one side of a quote is invalid, the full quote is rejected.

Quotes can be submitted with either one or both sides (buy/sell). Each side can have a different price or size.

Successfully accepted quotes act as limit orders.

Authorized CME Globex Market Makers may use Mass Quoting to submit bid/ask pairs and generate two-sided markets for multiple instruments for options on futures.

9.2 Quote Modify

Market Makers may perform the following types of modifications:

- Modify both sides of an existing quote.
- Modify one side of an existing quote (opposite side unchanged)

The Market Maker can modify their resting quotes by sending in another Mass Quote message with the same identification (tag 107-SecurityDesc and tag 299-QuoteEntryID).

The identification must be unique per session per day. This unique identifier is the responsibility of the customer and is not validated by the trading engine.

CME Globex rejects incoming quotes if there is a resting quote from the same Market Maker with a different identification.

Incoming quotes replace resting quotes from the same Market Maker, if they have the same identification

A modification of a quote entails changing one or both of the values associated with the price and the quantity of one or more sides of a quote.

9.3 Quote Cancel

Quote cancel is accomplished by modifying the price and quantity of a quote to zero (0).

Market Makers may perform the following types of quote cancels:

- Cancel one side of a resting quote and leave the opposite side unchanged.
- Cancel one side of a resting quote and modify the opposite side.
- Cancel both sides of a resting quote.
- Modify only one side (bid or sell) of a resting quote by using the appropriate bid or offer quantity and price values in a new Mass Quote Entry message.

9.4 Lead Market Maker Order Matching

Lead Market Maker (LMM) is a designation given to CME Group authorized market makers. The LMM status provides special consideration in order matching.

An LMM order at the same price level as the top order will receive the LMM match percentage allocation before the top order allocation. LMM matching rules apply first and top order matching rules apply thereafter. An LMM order can also be a top order.

A top order that belongs to an LMM will be matched first and will not be included in the following calculations:

- If the LMM has a single order at an elected price level it will match N% of the remaining incoming order quantity, with N equal to the LMM's allocation percentage. However, the matched quantity will not exceed the LMM's order quantity.
- If the LMM has multiple orders at an elected price level, then the LMM quantity is aggregated and will match N% of the remaining incoming order quantity. Multiple LMM orders are matched on Time Priority basis until N% quantity allocation is fulfilled.

All remaining resting orders at an elected price level (including LMM orders) are matched according to FIFO rules.

10 Market Maker Protections

Market Maker Protections (MMP) are parameters set by Market Makers to provide a degree of risk protection by limiting the Market Maker's quote execution exposure. MMP is available exclusively to CME Globex registered Market Makers specifically using CME Globex Mass Quote functionality. Market Maker Protection parameters are set specifically for each Mass Quote Session Identification (Mass Quote ID) registered to the Market Maker. When Market Maker-defined protection values are met or exceeded within certain time intervals, the protections are triggered.

The Market Maker Protection functionality is supported for all premium traded options and volatility traded options. Market Maker Protections are not available for Futures Instruments.

The Mass Quote ID can be set up with Market Maker Protections at an individual Instrument group level, on a broader scale, or on a Product Line level encompassing multiple Instrument groups.

The Market Maker Protections are set by CME Globex prior to the Market Maker beginning Mass Quoting. Market Makers must contact their Global Account Manager (GAM) to implement, modify, or delete Market Maker Protections. Refer to GAM contact information later in this document.

Market Maker Protections are set by CME Group at the Instrument group level.

The following table describes available Market Maker Protections. A more detailed discussion of each protection is described later in this document.

Market Maker Protection	Reference	Description
New Quote Fill Protection	Value "X"	Number of new quote executions (Fills)
Execution Protection	Value "Y"	Number of separate executions (Fill)
Traded Quantity Protection	Value "Z"	Gross quantity of instruments traded
Delta Protection	Delta	Aggregate Delta value from each execution (Fill)
Buy/Sell Protection	Buy/Sell	Net quantity of instruments traded

10.1 New Quote Fill Protection (Value "X") – Number of New Quote Fills

The Market Maker specifies a threshold for the number of new quote fills per Mass Quote ID. The Protection calculation is based on the quote and not the number of executions the quote may generate. An entire quote entry that is fully filled will be shown as one in the New Quote Fill Protection count.

The CME Globex platform cancels all the remaining resting Market Maker's quotes when the number of new quote executions meets the number specified by the Market Maker for that Instrument group within the pre-defined time interval for that Mass Quote ID.

Example

Assume:

- New Quote Fills protection limit = 20 (as set by the Market Maker).
- Time Interval = 15 seconds (as set by CME).
- Market Maker has multiple resting quotes for a instrument group.

- No new quotes are entered during the 15 second time interval.

Within the CME designated 15-second time interval:

- A resting quote's bid is matched in 5 separate executions before being fully filled.
- A resting quote's ask is matched in 3 separate executions before being fully filled.

Even though the bid quote was hit 5 times, it only equates to a counter value of "1" because no other quote was entered by the Market Maker and executed during the time interval. Similarly, even though the ask side was taken 3 times, it only equates to a counter value of "1" because only 1 new quote was entered by the Market Maker and executed during the time interval.

As such, the bid quote execution increases the New Quote Fill counter by "1" and the ask quote execution increases the New Quote Fill counter by "1" resulting in a total New Quote Fill counter value of "2" for this Instrument group during the time interval.

In this example, the Market Maker's Protection would not be triggered because the New Quote Fill Protection is set at 20 and the counter total is 2. If the counter were to reach 20 full quote executions during the CME time interval, then CME Globex cancels all resting quotes within that Instrument group.

10.2 Execution Protection (Value "Y") – Number of Separate Executions

The Market Maker specifies a threshold for the number of executions per Mass Quote ID. When the Execution Protections threshold is met or exceeded, the CME Globex cancels all the remaining resting Market Maker's quotes.

The CME Globex platform allows this protection to be exceeded in instances when a single outbound quote matches with quotes or orders already resting in the book. In this case, there are several different traders already in the book at a price and cumulative quantity that is executed by the incoming Mass Quote message. Even though the Execution Protection is exceeded during the processing of the Mass Quote message, all eligible orders that are currently on the book are completely executed.

The CME Globex platform does not stop the match process during a single match event. Market Maker Protection mode is not activated until the order that activates Market Maker Protection is completed.

Note: If used in conjunction with the New Quote Fill protection, note that this value cannot be set to a number that is less than the New Fill Protection setting.

Example

Assume:

- Execution Protection limit = 25 executions (as set by the Market Maker).
- Time Interval = 15 seconds (as set by CME.)

If the Market Maker has 25 separate quote executions for a instrument group within the CME designated 15-second time interval, then CME Globex will cancel all resting quotes within that Instrument group.

10.3 Traded Quantity Protection (Value "Z") – Gross Quantity of Instruments

The Market Maker specifies a threshold for the quantity of instruments traded per Mass Quote ID. When the Traded Quantity Protection threshold is met or exceeded, the CME Globex platform cancels all the remaining resting Market Maker's quotes.

The CME Globex platform allows this protection to be exceeded in instances when a single outbound quote matches with quotes or orders already resting in the book. In this case, there are several different traders already in the book at a price and cumulative quantity that is executed by the incoming Mass Quote message. Even though the Traded Quantity Protection is exceeded during the processing of the Mass Quote message, all eligible orders that are currently on the book are completely executed.

The CME Globex platform does not stop the match process during a single match event. Market Maker Protection mode is not activated until the order that activates Market Maker Protection is completed.

Example

Assume:

- Traded Quantity Protection Limit = 200 (as set by the Market Maker).
- Time Interval = 15 seconds (as set by CME).

If the Market Maker has a total of 200 or more instruments matched for a instrument group in the CME designated 15-second time interval, then CME Globex will cancel all resting quotes within that Instrument group.

Traded Quantity Protection cannot be stopped mid-execution. As such, in the example above, if 190 instruments matched within the CME time interval and the Market Maker has a resting 50-lot matched entirely in one transaction event, then the Market Maker's total Quantity Execution counter will equal 240 instruments. Since 240 exceeds the Traded Quantity Protection Limit of 200, CME Globex cancels all resting quotes within that Instrument group. The Market Maker fills will show 240 instruments rather than the Traded Quantity Protection limit of 200 instruments.

10.4 Delta Protection

Market Maker protection for exposure to price change is provided by Delta Protection for both premium and volatility quoted markets. The Delta Protection function aggregates deltas from each trade in an instrument group within a Mass Quote ID. This implementation of Delta Protection as a type of Market Maker Protection does not balance an options position with an offsetting futures position.

Market Maker Delta Protection compares the absolute value of the CME Globex dynamically calculated Delta Counter Value with the Market Maker-defined Delta Protection Value. If the absolute value of the Delta Counter Value meets or exceeds the Delta Protection Value within the pre-defined Time Interval, then Market Maker Delta Protection is triggered.

10.4.1 Delta Counter Value

Delta Counter Value is calculated by CME Globex using the following rules:

- Market Maker buying calls or selling puts increments the Delta Counter Value by each instrument's Delta Value multiplied by the quantity of the trade.
- Market Maker selling calls or buying puts decrements the Delta Counter Value by each instrument's Delta Value multiplied by the quantity of the trade.
- The Delta Counter Value is kept as an absolute value.

10.4.2 Delta Protection Value

Delta Protection Value Minimum/Maximum is defined by the Market Maker and maintained by the CME Group Global Control Center (GCC).

10.4.3 Delta Value

Delta Value is determined for each option instrument from the Theoretical Inter-day Pricing System (TIPS). TIPS is a CME Group system that calculates a real-time theoretical price and theoretical delta value for a given instrument.

When Market Maker Delta Protection is triggered, all remaining resting quotes for that Market Maker (MM) are cancelled.

Note: New Mass Quotes are rejected from that Market Maker until either:

- The Market Maker resets the Market Maker Protection Flag to "Y", or
- Globex Control Center (GCC) internally resets the Market Maker Protection Flag.

Example

Assume:

Market Maker = XYZ

Delta Protection value = +/-580

ABC Call Bid Delta value = +50

ABC Call Ask Delta value = -50

ABC Put Bid Delta value = -60

ABC Put Ask Delta value = +60

Delta Counter value = 0

Market maker XYZ Initial Mass Quote Position

Order Book							
ABC Call				ABC Put			
Bid		Ask		Bid		Ask	
Qty	Price	Price	Qty	Qty	Price	Price	Qty
30	11	12	20	70	5	6	30

Trader 1 enters an order to Sell 5 ABC Calls at 11.

This order matches with XYZ Bids resting at the 11 price resulting in:

- Quantity available reduced to 25.
- Delta Count = +250 (ABC Call Bid Delta +50 * Quantity 5 = +250).

Trader 2 enters an order to Sell 4ABC Calls at 11.

Order Book							
ABC Call				ABC Put			
Bid		Ask		Bid		Ask	
Qty	Price	Price	Qty	Qty	Price	Price	Qty
30	11	12	20	70	5	6	30
25	11						

This order matches with XYZ Bids resting at the 11 price resulting in:

- Quantity available reduced to 21.
- Delta Counter value = +450 (ABC Call Bid Delta +50 * Quantity 4 = +200 + current Delta count of +250).

Order Book							
ABC Call				ABC Put			
Bid		Ask		Bid		Ask	
Qty	Price	Price	Qty	Qty	Price	Price	Qty
30	11	12	20	70	5	6	30
25	11						
21	11						

Trader 2 enters an order to Buy 5 ABC Calls at 12.

This order matches with XYZ Offers resting at the 12 price resulting in:

- Quantity available reduced to 15.
- Delta Counter value = +200 (ABC Call Ask Delta -50 * Quantity 5 = -250 + current Delta count of +450)

Order Book							
ABC Call				ABC Put			
Bid		Ask		Bid		Ask	
Qty	Price	Price	Qty	Qty	Price	Price	Qty
30	11	12	20	70	5	6	30
25	11	12	15				
21	11						

Trader 3 enters an order to Buy 2 ABC Puts at 6.

This order matches with XYZ Offers resting at the 6 price resulting in:

- Quantity available reduced to 28.
- Delta Counter value = +320 (ABC Put Ask Delta +60 * Quantity 2 = +120 + current Delta count of +200).

Order Book							
ABC Call				ABC Put			
Bid		Ask		Bid		Ask	
Qty	Price	Price	Qty	Qty	Price	Price	Qty
30	11	12	20	70	5	6	30
25	11	12	15			6	28
21	11						

Trader 2 enters an order to Sell 15 ABC Puts at 5.

This order matches with XYZ Offers resting at the 5 price resulting in:

- Quantity available reduced to 55.
- Delta Counter value = -580 (ABC Put Bid Delta -60 * Quantity 15 = -900 + current Delta count of +320)

Order Book							
ABC Call				ABC Put			
Bid		Ask		Bid		Ask	
Qty	Price	Price	Qty	Qty	Price	Price	Qty
30	11	12	20	70	5	6	30
25	11	12	15	55	5	6	28
21	11						

Market Maker Delta Protection Triggered.

When Delta Counter value = +/- 580 the Market Maker Delta Protection is triggered.

All remaining orders entered by Market Maker XYZ are cancelled from the book.

Order Book							
ABC Call				ABC Put			
Bid		Ask		Bid		Ask	
Qty	Price	Price	Qty	Qty	Price	Price	Qty
21	11	12	15	55	5	6	28

10.5 Buy/Sell Protection (Net Quantity of Instruments Traded)

Market Maker Buy/Sell Protection counts the number of instruments bought and sold using a specific Mass Quote ID within the Time Interval. The count of buys and sells is determined at the outright leg level for spreads and covered combinations.

The CME Globex platform triggers Buy/Sell Protection when the absolute value of the Buy/Sell Counter Value meets or exceeds the Buy/Sell Protection Value.

10.5.1 Buy/Sell Counter Value

Buy/Sell Counter Value Increments and decrements with the number of instruments bought and sold per Instrument group.

- Market Maker buying Calls or Puts will add 1 per instrument to the Buy/Sell Counter.
- Market Maker selling Calls or Puts will subtract 1 per instrument from the Buy/Sell Counter. The count is kept as an absolute value.

Note: New Mass Quotes are rejected from that Market Maker until either:

- The Market Maker resets the Market Maker Protection Flag to "Y", or
- Globex Control Center (GCC) internally resets the Market Maker Protection Flag.

Example

Assume:

Market Maker = XYZ

Buy/Sell Protection value = +/-17

ABC Call Bid Quantity increments Buy/Sell Protection Count

ABC Call Ask Quantity decrements Buy/Sell Protection Count

ABC Put Bid Quantity decrements Buy/Sell Protection Count

ABC Put Ask Quantity increments Buy/Sell Protection Count

Buy/Sell Protection Count = 0

Market Maker XYZ Initial Mass Quote Position

Order Book							
ABC Call				ABC Put			
Bid		Ask		Bid		Ask	
Qty	Price	Price	Qty	Qty	Price	Price	Qty
30	11	12	20	70	5	6	30

Trader 1 enters an order to Sell 5 ABC Calls at 11.

This order matches with Bids resting at the 11 price resulting in:

- Quantity available reduced to 25.
- Buy/Sell Protection Count = +5 (Buy/Sell Protection count of 0 + Quantity 5)

Order Book							
ABC Call				ABC Put			
Bid		Ask		Bid		Ask	
Qty	Price	Price	Qty	Qty	Price	Price	Qty
30	11	12	20	70	5	6	30
25	11						

Trader 2 enters an order to Sell 4 ABC Calls at 11.

This order matches with Bids resting at the 11 price resulting in:

- Quantity available reduced to 21.
- Buy/Sell Protection Count = +9 (Buy/Sell Protection count of 5 + Quantity 4)

Order Book							
ABC Call				ABC Put			
Bid		Ask		Bid		Ask	
Qty	Price	Price	Qty	Qty	Price	Price	Qty
30	11	12	20	70	5	6	30
25	11						
21	11						

Trader 2 enters an order to Buy 5 ABC Calls at 12.

This order matches with Offers resting at the 12 price resulting in:

- Quantity available reduced to 15.
- Buy/Sell Protection Count = +4 (Buy/Sell Protection count of 9 - Quantity 5)

Order Book							
ABC Call				ABC Put			
Bid		Ask		Bid		Ask	
Qty	Price	Price	Qty	Qty	Price	Price	Qty
30	11	12	20	70	5	6	30
25	11	12	15				
21	11						

Trader 3 enters an order to Buy 2 ABC Puts at 6.

This order matches with Offers resting at the 6 price resulting in:

- Quantity available reduced to 28.
- Buy/Sell Protection Count = +2 (Buy/Sell Protection count of 4 - Quantity 2)

Order Book							
ABC Call				ABC Put			
Bid		Ask		Bid		Ask	
Qty	Price	Price	Qty	Qty	Price	Price	Qty
30	11	12	20	70	5	6	30
25	11	12	15			6	28
21	11						

Trader 2 enters an order to Sell 15 ABC Puts at 5.

This order matches with Offers resting at the 5 price resulting in:

- Quantity available reduced to 55.
- Buy/Sell Protection Count = +17 (Buy/Sell Protection count of 2 + Quantity 15)

Order Book							
ABC Call				ABC Put			
Bid		Ask		Bid		Ask	
Qty	Price	Price	Qty	Qty	Price	Price	Qty
30	11	12	20	70	5	6	30
25	11	12	15	55	5	6	28
21	11						

Market Maker Buy/Sell Protection Triggered.

When the Buy/Sell Protection = +/- 17 the Market Maker Buy/Sell Protection is triggered.

All remaining orders entered by Market Maker XYZ are cancelled from the book.

Order Book							
ABC Call				ABC Put			
Bid		Ask		Bid		Ask	
Qty	Price	Price	Qty	Qty	Price	Price	Qty
21	11	12	15	55	5	6	28

10.5.2 Protection Level Met or Exceeded

When a protection threshold is reached (or exceeded in certain scenarios), CME Globex initiates the Market Maker Protection mode, which rejects all new Mass Quote messages and cancels resting quotes for all instruments associated with the Mass Quote ID. If a Mass Quote message contains multiple quotes and one of the quotes activates Market Maker Protection mode, then the CME Globex platform cancels the remaining quotes in the message as well as all resting quotes for that Mass Quote ID.

10.5.3 Time Interval Control

A Time Interval Control is in place for each Market Maker Protection. CME Group determines the Time Interval value for all options Instrument groups. The intent is to ensure that the Market Maker Protection counts remain a real-time representation of the market condition. The Time Interval operates under the same concept as a stopwatch with the intent to measure market trade activity.

The CME Globex platform starts the Time Interval when an execution (Fill) takes place. If the elapsed time from the Time Interval start is greater than the CME Globex assigned Time Interval Value, the CME Globex platform resets the protection counters of the enabled Market Maker Protections to zero.

The current CME Globex Time Interval Value setting for all MMPs is 15 seconds.

10.5.4 Structure of MMP Implementation

The Market Maker has the choice of setting each Mass Quote ID's Market Maker Protections for a specific Instrument group or for a Product Line which includes multiple Instrument groups.

The Product Line level of protection allows the Market Maker the flexibility to design appropriate protection criteria based on the Market Maker's trading strategy and the inter-market relationships of the different instruments within a product line. A detailed discussion of the available Product Line structures used with Market Maker Protections is available later in this document.

The Instrument group level of protection allows the Market Maker to focus on a specific set of Instrument expiries within a instrument group.

The Market Maker Protections are set for each Mass Quote ID at the Instrument group level.

The following illustrates the relationship of product line, instrument group, and instrument used in Market Maker Protection:

Protection Level	Description	Example
Product Line	<p>A CME Group-defined umbrella designation given to include similar Instrument groups. A product line includes outright instruments and spreads. The CME Group defines the specific Instrument groups that are associated with each Product Line.</p> <p>Market Makers are not allowed to define subset or customized Product Lines</p>	<p>Product Line - EuroDollar</p> <p>Instrument group ZE - EuroDollar Option Outright</p> <p>Instrument group E\$ - EuroDollar Options strategies</p> <p>Instrument group E0 - 1-Year EuroDollar Mid-Curve</p> <p>Instrument group E2 - 2-Year EuroDollar Mid-Curve</p> <p>Instrument group E5 - 5-Year EuroDollar Mid-Curve</p>
Instrument group	A collection of related instruments	Instrument group ZE - EuroDollar Option Outright
Instrument	Individual instrument define by expiry	Instrument - ZEU0 9700 Sept 2009 9700 Strike

10.5.5 Enabling Market Maker Monitoring Mode

By default, Market Maker Monitoring mode is not enabled for Mass Quote IDs. Even though Market Maker Protection values may be in place, the Market Maker must proactively enable Market Maker Monitoring mode through the Mass Quote tag 35-MsgType=i message.

The CME Globex platform will accept Mass Quote tag 35-MsgType=i messages only after the Market Maker sends the reset request through the Mass Quote message to enable or re-enable the Market Maker Monitoring mode. This is especially true after Market Maker Protections have been triggered, which required the Market Maker to re-enable the Market Maker Monitoring mode.

The Market Maker Protection Reset (tag 9773-MMPProtectionReset=Y) within the Mass Quote messages is used to set/reset Market Maker Monitoring mode for the instrument group.

The Market Maker Protection Reset (tag 9773-MMPProtectionReset) does not affect the Market Maker Protection threshold values. The Market Maker Protection Reset is used only to set/reset the Market Maker Monitoring mode. Market Maker Protection threshold values are set/reset by contacting a CME Globex Account Manager.

A technical discussion of Market Maker Functionality and the associated CME Globex messaging can be found in Advanced Functionality.

10.5.6 Setting Market Maker Protection Threshold Values

The Market Maker must call or e-mail their Global Account Manager (GAM) to initially set or modify their Market Maker Protection threshold values.

10.5.7 Product Line Protection

The intent of Product Line Protection is to allow the Market Maker the flexibility to design appropriate protection criteria based on the Market Maker's trading strategy and the inter-market relationships of the different Instrument groups within a Product Line.

The Market Maker can choose to set the Mass Quote for a particular instrument or an entire Product Line comprised of multiple Instrument groups. If a Product Line is chosen, the Market

Maker then has the ability to set Market Maker Protections for each Instrument group within the Product Line.

Focusing on Market Maker Protection from the Product Line level allows the Market Maker two additional methods of exiting the market in the event a protection threshold is met or exceeded. The following summarizes the two forms of Product Line protection.

- **Aggregate Product Line** - The protection count is aggregated from execution activity in each Instrument group for the overall Product Line. If the Market Maker Protection threshold level is met or exceeded at the Product Line level, all quotes for all Instrument groups within the Product Line are cancelled.
- **Individual Product Line** - The protection count is kept at the Individual Instrument group level for each Instrument group within the Product Line. When any individual Instrument group count meets or exceeds its Market Maker Protection threshold level, all quotes for all Instrument groups within the Product Line are cancelled.

All standard Market Maker Protections are additionally available.

10.5.8 Aggregate Product Line Production

The intent of the Aggregate Product Line Protection is to allow Market Maker Protection for each Instrument group and also provide Market Maker Protection for the overall Product Line. The Market Maker can set Market Maker Protection thresholds at the overall Product Line level and also at each Instrument group level.

The Product Line and Instrument group levels of protection operate in relation to each other. If the Market Maker Protection threshold is met or exceeded for an individual Instrument group, all quotes within that Instrument group only are cancelled. Additionally each Instrument group count is aggregated into the count for the overall Product Line. If the Market Maker Protection threshold is met or exceeded at the Product Line level, all quotes for all Instrument groups within the Product Line are cancelled.

The following example illustrates the Aggregate Product Line Protection:

	Market Maker Protection Value	
	Delta	Buy/Sell
Product Line - EuroDollar	500	200
Instrument Group ZE - EuroDollar Option Outright	50	
Instrument Group ES - EuroDollar Option Spreads	50	10
Instrument Group E0 - 1-Year EuroDollar Mid-Curve		5
Instrument Group E2 - 2-Year EuroDollar Mid-Curve		5
Instrument Group E5 - 5-Year EuroDollar Mid-Curve	25	

Assume that at the Product Line level, there are Market Maker Protections Delta and Buy/Sell threshold levels set at 500 and 200 respectively. At the Instrument group level there are various combinations of Delta and Buy/Sell Market Maker Protection thresholds set for each Instrument group within the Product Line.

Each time any trade activity takes place within a instrument group, a Market Maker Protection count is kept for the Instrument group and a second Market Maker Protection count is kept at the overall Product Line level. For instance, if 2 Buy quotes trade in Instrument group E2, the E2 Buy/Sell count would be 2 and the Product Line Buy/Sell aggregate count would be 2. If the Instrument group E5 trades 4 Buy quotes, the E5 Buy/Sell count would be 4 and the Product Line Buy/Sell aggregate count would be increased to 6.

If the Instrument group E\$ Market Maker Protection count meets or exceeds the value of 50 for the Delta Protection count or 10 for the Buy/Sell Protection count, all quotes remaining in the E\$ Instrument group are cancelled. Quotes in place in the other Instrument groups are not affected and are kept active.

If the EuroDollar Product Line level aggregate count meets or exceeds the value of 500 for the Delta Protection count or 200 for the Buy/Sell Protection count, all quotes in all Instrument groups in the EuroDollar Product Line are cancelled.

Example of Aggregate Product Line Protection (with Buy/Sell Protection)

The Aggregate Product Line Protection provides each Market Maker the facility to set Market Maker Protection thresholds at the overall Product Line level and at each Instrument group level.

Assume:

Market Maker = XYZ

Product Line = Eurodollar

Product Line Protection Value = +/-200

Buy/Sell Protection

Market Maker buying Calls or Puts will add the traded quantity to the buy/sell count.

Market Maker selling Calls or Puts will subtract the traded quantity from the buy/sell count.

Instrument group Protection Limits set at:

ZE	100
E\$	250
E0	150
E2	100
E5	100

The following example markets are abbreviated to show only the Bid side or Ask side due to space considerations. All entries shown with grey background indicate an entry that has been replaced or cancelled.

Market Maker XYZ Initial Mass Quote Position

Eurodollar Product Line									
ZE		E\$		E0		E2		E5	
Call Bid		Put Ask		Put Bid		Put Ask		Put Ask	
Qty	Price	Qty	Price	Qty	Price	Qty	Price	Qty	Price
130	11	170	5	150	6	150	15	130	6

Trader 1 enters an order to Sell 50 ZE Calls at 11.

This order matches with XYZ Call Bids resting at the 11 price resulting in:

- Quantity available reduced to 80.
- Product Line Protection Count = +50 (Product Line Protection count of 0 + Quantity 50).
- Instrument group ZE count = +50.

Eurodollar Product Line									
ZE		E\$		E0		E2		E5	
Call Bid		Put Ask		Put Bid		Put Ask		Put Ask	
Qty	Price	Qty	Price	Qty	Price	Qty	Price	Qty	Price
130	11	170	5	150	6	150	15	130	6
80	11								

Trader 2 enters an order to Buy 150 E\$ Puts at 5.

This order matches with XYZ Put Offers (Ask) resting at the 5 price resulting in:

- Quantity available reduced to 20.
- Product Line Protection Count = -100 (Product Line Protection count of +50 - Quantity 150).
- Instrument group E\$ count = -150.

Eurodollar Product Line									
ZE		E\$		E0		E2		E5	
Call Bid		Put Ask		Put Bid		Put Ask		Put Ask	
Qty	Price	Qty	Price	Qty	Price	Qty	Price	Qty	Price
130	11	170	5	150	6	150	15	130	6
80	11	20	5						

Trader 3 enters an order to Sell 50 E0 Puts at 6.

This order matches with Put Bids resting at the 6 price resulting in:

- Quantity available reduced to 100.
- Product Line Protection Count = -50 (Product Line Protection count of -100 + Quantity 50).
- Instrument group E0 count = +50

Eurodollar Product Line									
ZE		E\$		E0		E2		E5	
Call Bid		Put Ask		Put Bid		Put Ask		Put Ask	
Qty	Price	Qty	Price	Qty	Price	Qty	Price	Qty	Price
130	11	170	5	150	6	150	15	130	6
80	11	20	5	100	6				

Trader 3 enters an order to Buy 50 E2 Puts at 15.

This order matches with Put Offers (Ask) resting at the 15 price resulting in:

- Quantity available reduced to 100.
- Product Line Protection Count = -100 (Product Line Protection count of -50 - Quantity 50).
- Instrument group E2 count = -50.

Eurodollar Product Line									
ZE		E\$		E0		E2		E5	
Call Bid		Put Ask		Put Bid		Put Ask		Put Ask	
Qty	Price	Qty	Price	Qty	Price	Qty	Price	Qty	Price
130	11	170	5	150	6	150	15	130	6
80	11	20	5	0	6	100	15		

Trader 1 enters an order to Buy 50 E2 Puts at 15.

This order matches with Put Offers (Ask) resting at the 15 price resulting in:

- Quantity available reduced to 50.
- Product Line Protection Count = -100 (Product Line Protection count of -50 - Quantity 50).
- Instrument group E2 count = -100 (E2 earlier count -50 - Quantity 50).

E2 Instrument group Protection Triggered

E2 Instrument group count meets the limit value of +/- 100. The remaining 50 quotes are cancelled from the E2 Instrument group. No other Instrument group is affected.

Eurodollar Product Line									
ZE		E\$		E0		E2		E5	
Call Bid		Put Ask		Put Bid		Put Ask		Put Ask	
Qty	Price	Qty	Price	Qty	Price	Qty	Price	Qty	Price
130	11	170	5	150	6	150	15	130	6
80	11	20	5	0	6	100	15		
						50	15		

Trader 2 enters an order to Buy 100 E5 Puts at 6.

This order matches with Put Offers (Ask) resting at the 15 price resulting in:

Quantity available reduced to 30.

Product Line Protection Count = -200 (Product Line Protection count of -100 - Quantity 100).

Instrument group E5 count = -100

Eurodollar Product Line									
ZE		E\$		E0		E2		E5	
Call Bid		Put Ask		Put Bid		Put Ask		Put Ask	
Qty	Price	Qty	Price	Qty	Price	Qty	Price	Qty	Price
130	11	170	5	150	6	150	15	130	6
80	11	20	5	0	6	100	15	30	6
						50	15		

10.5.9 Aggregate Product Line Protection – Buy/Sell Protection Triggered

Product Line Protection - Buy/Sell Protection count meets the limit value of +/- 200.

The Product Line Protection is triggered and all remaining XYZ quotes for all other Instrument groups within the Product Line are cancelled.

Eurodollar Product Line									
ZE		E\$		E0		E2		E5	
Call Bid		Put Ask		Put Bid		Put Ask		Put Ask	
Qty	Price	Qty	Price	Qty	Price	Qty	Price	Qty	Price
130	11	170	5	150	6	150	15	130	6
80	11	20	5	0	6	100	15	30	6
						50	15		

10.5.10 Individual Product Line Protection

The Individual Product Line Protection focuses on each individual Instrument group count within the Product Line. When any individual Instrument group count meets or exceeds its Market Maker Protection level, all quotes for all Instrument groups within the Product Line are cancelled.

The following illustrates the Individual Product Line Protection:

	Market Maker Protection Value	
	Delta	Buy/Sell
Product Line - EuroDollar	Not applicable	Not applicable
Instrument Group ZE - EuroDollar Option Outright	50	
Instrument Group E\$ - EuroDollar Option Spreads	50	10
Instrument Group E0 - 1-Year EuroDollar Mid-Curve		5
Instrument Group E2 - 2-Year EuroDollar Mid-Curve		5
Instrument Group E5 - 5-Year EuroDollar Mid-Curve	25	

For Individual Product Line Protection, there are no Market Maker Protection counts kept at the Product Line level. At the Instrument group level there are various combinations of Market Maker Protection thresholds set for each Instrument group.

Each time any trade activity takes place within a instrument group, the Market Maker Protection count is kept individually for each Instrument group. For instance, if 2 Buy quotes are traded in Instrument group E2, the E2 Buy/Sell count would be 2. If the Instrument group E5 traded 4 Buy quotes, the E5 Buy/Sell count would be 4.

If the E\$ Instrument group's Market Maker Protection count meets or exceeds the value of 50 for the Delta Protection count or 10 for the " -Buy/Sell Protection count, all quotes in all Instrument groups in the EuroDollar Product Line are cancelled.

Example

The Individual Product Line Protection focuses on each individual Instrument group count within the Product Line. The Market Maker Protection count is kept for each Instrument group separately and when any individual Instrument group count meets or exceeds its MMP level, all quotes for all Instrument groups within the Product Line are cancelled.

Assume:

Market Maker = XYZ

Product Line = Eurodollar

Product Line Protection Value = (No Product Line Protection allowed)

Buy/Sell Protection

Market Maker buying Calls or Puts will add the traded quantity to the buy/sell count

Market Maker selling Calls or Puts will subtract the traded quantity from the buy/sell count

Market Maker Protection Threshold Limits set at:

ZE	100
E\$	250
E0	150
E2	100
E5	100

Note: The following example markets are abbreviated to show only the Bid side or Ask side due to space considerations. All entries shown with grey background indicate an entry that has been replaced or cancelled.

Market Maker XYZ Initial Mass Quote Position

Eurodollar Product Line									
ZE		E\$		E0		E2		E5	
Call Bid		Put Ask		Put Bid		Put Ask		Put Ask	
Qty	Price	Qty	Price	Qty	Price	Qty	Price	Qty	Price
130	11	170	5	150	6	150	15	130	6

Trader 1 enters an order to Sell 50 ZE Calls at 11.

This order matches with Call Bids resting at the 11 price resulting in:

- Quantity available reduced to 80.
- ZE Instrument group level Protection Count = +50

Eurodollar Product Line									
ZE		E\$		E0		E2		E5	
Call Bid		Put Ask		Put Bid		Put Ask		Put Ask	
Qty	Price	Qty	Price	Qty	Price	Qty	Price	Qty	Price
130	11	170	5	150	6	150	15	130	6

80	11								
----	----	--	--	--	--	--	--	--	--

Trader 2 enters an order to Buy 150 E\$ Puts at 5.

This order matches with Put Offers (Ask) resting at the 5 price resulting in:

- Quantity available reduced to 20.
- E\$ Instrument group Protection Count = -150

Eurodollar Product Line									
ZE		E\$		E0		E2		E5	
Call Bid		Put Ask		Put Bid		Put Ask		Put Ask	
Qty	Price	Qty	Price	Qty	Price	Qty	Price	Qty	Price
130	11	170	5	150	6	150	15	130	6
80	11	20	5						

Trader 3 enters an order to Sell 50 E0 Puts at 6.

This order matches with Put Bids resting at the 6 price resulting in:

- Quantity available reduced to 100.
- E0 Instrument group Protection Count = +50

Eurodollar Product Line									
ZE		E\$		E0		E2		E5	
Call Bid		Put Ask		Put Bid		Put Ask		Put Ask	
Qty	Price	Qty	Price	Qty	Price	Qty	Price	Qty	Price
130	11	170	5	150	6	150	15	130	6
80	11	20	5	100	6				

Trader 4 enters an order to Sell 100 E0 Puts at 6.

This order matches with Put Offers (Ask) resting at the 6 price resulting in:

- Quantity available reduced to 0.
- E0 Instrument group Protection Count = +150 (E0 earlier count +50 + Quantity 100)

Eurodollar Product Line									
ZE		E\$		E0		E2		E5	
Call Bid		Put Ask		Put Bid		Put Ask		Put Ask	
Qty	Price	Qty	Price	Qty	Price	Qty	Price	Qty	Price
130	11	170	5	150	6	150	15	130	6
80	11	20	5	100	6				
				0	6				

10.5.11 Individual Product Line Protection – Buy/Sell Triggered for Instrument group E0

E0 Instrument group's Buy/Sell Protection count meets the limit value of +/- 150.

Market Maker Protection is triggered and all remaining quotes in the EuroDollar Product Line are cancelled.

Eurodollar Product Line									
ZE		E\$		E0		E2		E5	
Call Bid		Put Ask		Put Bid		Put Ask		Put Ask	
Qty	Price	Qty	Price	Qty	Price	Qty	Price	Qty	Price
130	11	170	5	150	6	150	15	130	6
80	11	20	5	100	6				
				0	6				

11 Electronic Trading System Considerations

CME Group requires member firms to limit transaction message rates to CME Group-defined benchmarks or pay a surcharge for exceeding these limits. CME Group evaluates compliance with these benchmarks daily.

CME Group measures the trading activity of each clearing member firm (active or inactive clearing member firms which maintain relationships with the CME Group Clearing House). The measurement, called the Volume Ratio, evaluates a clearing member firm's message count to traded volume.

Note: Designated CME Group Market Maker trading activity is excluded from product benchmark calculations (registered Market Maker firms are subject to program-specific product benchmarks.)

11.1 Volume Ratio Overview

For a given product, CME Group calculates a benchmark Volume Ratio by comparing the total number of messages to executed contracts during RTH hours (i.e. 7:00 a.m.– 4:00 p.m. Central Time), and adding a pre-determined variation. The variation will vary by product to allow for legitimate trading strategies in each product.

Product Volume Ratio benchmarks are published quarterly and include the most active roll periods in the calculation.

To view the current quarter's volume ratio benchmarks for each product, visit:

<http://www.cmegroup.com>.

11.1.1 Exceeding the CME Group Product Volume Ratios

Clearing member firms must not exceed the product-specific Volume Ratio benchmarks (which include the variation amount). If a clearing member firm exceeds the Volume Ratio, CME Group issues two "notices" (one per session) within a rolling 30 business day period. Thereafter, CME Group charges the clearing member firm a surcharge per product, per session each time the Volume Ratio is exceeded.

11.1.2 Additional Information

To view details on the CME Group messaging policy, including volume ratio definitions, exceptions to the policy, and surcharge amounts, visit <http://www.cmegroup.com>.

11.2 Fault Tolerance

Mission critical client applications must continue to function properly despite sudden difficulties such as process termination, hardware failure, or network disconnects. Fault tolerance in a network environment is characterized by rapid recovery from such failures. One method of providing fault-tolerance is through a mechanism called Failover; the goal is to minimize service interruption caused by error conditions listed above.

iLink 2.X detects five different categories of error conditions:

- Client primary process failure
- Client backup process failure
- Primary iLink FIX Gateway failure
- Backup iLink FIX Gateway failure
- Network failure

Process failure may be caused by hardware failure of the machine on which the process runs, as well as software error; faulty logic, and improper memory handling, among others. Network failure includes loss of TCP/IP connectivity between the client application and the iLink FIX Gateway.

This may be caused by such items as faulty network interface cards, frayed wires, and power failure on network components (i.e. routers).

The iLink FIX Gateway initiates a controlled failover when it detects either process or network failure that impacts its ability to service the client.

11.2.1 Client Primary Process Failure

If iLink 2.X does not receive any messages from the primary client process within the defined heartbeat interval:

- CME Globex sends a Test Request message to invoke a Heartbeat message from the client.
- If the primary client process does not respond with a Heartbeat message to the Test Request message within the defined heartbeat interval (or if the client does not send any message during the entire interval), iLink 2.X designates the primary client process as failed and initiates failover.
- The primary client application is disconnected from iLink 2.X.
- One of the backup client applications is chosen to communicate over a new primary channel.
- The backup client application is notified of such fault tolerance status change by examining the FTI in the TargetCompID of the next incoming message.
- If the primary client process fails without closing the TCP connection, then it takes two Heartbeat intervals for iLink 2.X to detect the primary process failure. The backup client application should check the FTI on every message to determine its status. If clients want to avoid the time delay in this process, then they should ensure that the TCP connection is closed whenever their application fails.

IMPORTANT: Before failover, the backup client application was receiving sequence numbers set to zero. During and after the failover process, the backup client application is responsible for ensuring that its inbound and outbound sequence numbers are synchronized with the primary application that just failed. This is critical since the newly elected primary member must know exactly where the failed member left off. If the sequence number of the message sent by the new primary client application is lower than that of the original client application, iLink 2.X logs the client application out per the FIX 4.2 protocol.

11.2.2 Client Backup Process Failure

If iLink 2.X does not receive any message from a backup client application within a defined interval:

- CME Group sends a Test Request message to invoke a Heartbeat message from the client.
- If there is no response to the Test Request message within the defined heartbeat interval (or if the client does not send any administrative message during the entire interval), the backup client application is disconnected from iLink 2.X.
- The status of the primary client application connectivity remains intact.

11.2.3 Primary iLink FIX Gateway Failure

If the primary iLink FIX Gateway fails:

- CME Globex initiates failover by electing the ranking inactive iLink FIX Gateway to assume the primary role.
- The client application that is connected to this newly chosen iLink FIX Gateway must act as the primary for the client application FT Group.
- The client application is notified to become primary by examining the FTI in the Tag 56-TargetCompID of next incoming message.

11.2.4 Backup iLink FIX Gateway Failure

iLink 2.X maintains a predefined number of processes running for each iLink 2.X component. If a backup iLink Gateway fails:

- The failed iLink Gateway is restored.
- The backup client application must reestablish the connection to this restored backup iLink Gateway to maintain a pool of backup content streams.
- The status of the primary client application connectivity remains intact.

11.2.5 Network Failure

iLink 2.X handles socket exceptions that are thrown for network error conditions (i.e., loss of TCP/IP connectivity between the client application and the iLink Gateway). When this happens, iLink 2.X designates the primary content stream as failed and initiates the failover.

11.2.6 Clients Choosing Not to Implement Fault Tolerance

iLink 2.X does not mandate that clients use the fault tolerance feature; however, CME Group strongly recommends using this functionality. Clients who do not implement the fault tolerance cannot dynamically recover from process or network failures.

For customers who do not want to implement fault tolerance, CME Group provides an optional method for using the fault-tolerance indicator. Customers not implementing fault-tolerance on their applications may submit their logon request with an FTI of 'N'. The CME Group responds with a logon confirmation message with an FTI of 'N' and expects all subsequent messages during that session to contain an FTI of 'N'. If the customer submits a message with an FTI of anything other than 'N', he is logged out.

This functionality also prohibits a customer from attempting to log in with another application. If a customer requests multiple iLink Gateways for fault-tolerance availability, but chooses to submit a logon message with an FTI of 'N', any attempts to authenticate through another iLink Gateways result in a logout of those requests from the FIX Gateway. The existing, authenticated session is not affected.

11.3 Summary of Fault Tolerance Requirements on Client Applications

The guidelines for implementing fault tolerant client applications are:

- Coordinate applications such that the primary and backup processes each establish a separate and independent content stream to the iLink Gateways via TCP/IP socket connection.
- For the Beginning of Week and Mid-Week Logon, set the FTI in tag 49-SenderCompID field to "U" for undefined.
- For the In-Session Logon, set the FTI in tag 49-SenderCompID field to "P".
- Examine the FTI in the TargetCompID (tag 56) for each incoming message. Depending upon its value, the client application must behave accordingly.
- Send application messages (e.g. New Order - Single, Order Cancel/Replace Request) only through the primary content stream where sequencing is enforced per FIX 4.2 protocol.
- Send only administrative messages over a backup content stream. Communication over a backup content stream is for link maintenance via administrative messages only. Application messages sent over a backup connection are rejected.
- Messages exchanged over a backup content stream serve to maintain only the connection. As a result, sequence numbers are not relevant and are "0" (zero).
- Maintain tracking of inbound and outbound sequence numbers between the primary and backup client processes to ensure proper failover processing.

Clients who choose not to implement fault tolerance may submit a logon message with the FTI of tag 49-SenderCompID set to 'N'

11.4 Identification of CME Globex Terminal Operators – Tag 50

Rule 576 ("Identification of Globex Terminal Operators") requires that each order entered into CME Globex include the submission of an Operator ID, also referred to as the "Tag 50 ID" or "User ID". The requirements of Rule 576 are identical across the four CME Group self-regulatory organizations: CME, CBOT, NYMEX and COMEX. For orders entered manually, the Operator ID must be unique to the individual entering the order into CME Globex. For orders entered by an automated trading system ("ATS"), the Operator ID must be unique to the person, or the identified team of persons on the same shift, who are responsible for the operation of this ATS. All Operator IDs must be unique at the level of the clearing member firm.

There is a summary [document](#) on the CME Group website that provides information regarding clearing firm responsibilities, guidelines for ATS, and general registration requirements. It also includes a link to the Rulebooks and the most recent applicable Market Regulation Advisory.

Appendix A: Futures Spread Type Availability per Product Complex

CME Globex offers the following exchange recognized Futures Spread Types that are compatible with the following products:

Strategy	Type Code	EQ	FX	AG	IR	Energy	Metals
Calendar	SP			X	X	X	X
Foreign Exchange	FX		X	X			
Reduced Tick	RT				X	X	X
Equities	EQ	X		X			
Butterfly	BF	X		X	X		
Condor	CF			X	X		
Strip	FS	X	X	X	X	X	X
Inter-commodity	IS	X	X	X	X	X	X
Pack	PK				X		
Month Pack	MP				X		
Pack Butterfly	PB				X		
Double Butterfly	DF				X		
Pack Spread	PS				X		
Crack 1:1	C1					X	X
Bundle	FB				X		
Bundle Spread	BS				X		

Appendix B: Spread Construction

The following table summarizes the construction of Futures Spreads.

Futures			
Spread Type	Type Code	Construction	Instrument Code / Security Definition
Calendar			
Foreign Exchange	FX	Buy1exp2 Sell1exp1	6EH9-6EZ8
Reduced Tick	RT	Buy1exp1 Sell1exp2	ZBZ8-ZBH9
Standard	SP	Buy1exp1 Sell1exp2	GEZ8-GEH9
Equities	EQ	Sell1exp1 Buy1exp2	ESZ8-ESH9
Butterfly	BF	Buy1exp1 Sell2exp2 Buy1exp3	GE:BFM8-U8-Z8
Condor	CF	Buy1exp1 Sell1exp2 Sell1exp3 Buy1exp4	GE:CFZ8H9M9U9
Strip Month Expiry Year Expiry	FS	Buy1exp1 Buy1exp2 Buy1exp3 Buy1exp4	CL:FS 03M U8 ZB:FS 01Y U8
Inter-commodity	IS	Buy1exp1com1 Sell1exp1com2	GTBZ8-GEH9
Pack	PK	Buy1exp1 Buy1exp2 Buy1exp3 Buy1exp4	GE:PK 01Y M8
Month Pack	MP	Buy4exp1 Sell (Pack)1exp2	GE:MP Z8 1YH9
Pack Butterfly	PB	Buy1(Pack)exp1 Sell2 (Pack)exp2 Buy1(Pack)exp3	GE:PB Z8-Z9-Z0
Double Butterfly	DF	Buy1exp1 Sell3exp2 Buy3exp3 Sell1exp4	ES:DF Z8H9M9U9
Pack Spread	PS	Buy1(Pack)exp1 Sell1(Pack)exp2	GE:PS Z8-H9
Crack 1:1	C1	Buy1exp1Distillate Sell1exp1Crude	CL:C1 HO-CL U8
Bundle	FB	Buy1exp1 Buy1exp2 Buy1exp3 Buy1exp4 Buy2exp5 Buy3exp6 Buy4exp7 Buy5exp8	GE:FB 02Y M8
Bundle Spread	BS	Buy1(Bundle)exp1 Sell1(Bundle)exp2	GE:BS 2YU8 2YU9

Options		
Strategy Type	Type Code	Construction
Calendar <ul style="list-style-type: none"> Horizontal 	HO	Call Horizontal: Sell1callstrike1exp1 Buy1callstrike1exp2 Put Horizontal: Sell1putstrike1exp1 Buy1putstrike1exp2
Calendar <ul style="list-style-type: none"> Diagonal 	DG	Call Buy1callstrike1exp1 Sell1callstrike2exp2 Put Buy1 putstrike1exp1 Sell1 putstrike2exp2
Straddle	ST	Buy1callstrike1exp1 Buy1putstrike1exp1
Strangle	SG	Buy1putstrike1exp1 Buy1callstrike2exp1
Vertical	VT	Call Buy1callstrike1exp1 Sell1callstrike2exp1 Put Buy1putstrike2exp1 Sell1putstrike1exp1
Box	BX	Buy1callstrike1exp1 Sell1putstrike1exp1 Buy1putstrike2exp1 Sell1callstrike2exp1
Butterfly	BO	Call Buy1callstrike1exp1 Sell2callstrike2exp1 Buy1callstrike3exp1 Put Buy1putstrike3exp1 Sell2putstrike2exp1 Buy1putstrike1exp1
Conditional Curve	CC	Call Buy1callstrikeexp1instr1 Sell1callstrikeexp1instr2 Put Buy1putstrikeexp1 instr1 Sell1putstrikeexp1 instr2
Condor	CO	Call Buy1callstrike1exp1 Sell1callstrike2exp1 Sell1callstrike3exp1 Buy1callstrike4exp1 Put Buy1putstrike4exp1 Sell1putstrike3exp1 Sell1putstrike2exp1 Buy1putstrike1exp1
Double	DB	Call Buy1callstrike1exp1 Buy1callstrike2exp1 Put Buy1putstrike2exp1 Buy1putstrike1exp1
Horizontal Straddle	HS	Buy1callstrike1exp2 Buy1putstrike1exp2 Sell1callstrike1exp1 Sell1putstrike1exp1
Iron Condor	IC	Sell1putstrike1exp1 Buy1putstrike2exp1 Buy1callstrike3exp1 Sell1callstrike4exp1
Ratio 1x2	12	Call Buy1callstrike1exp1 Sell2callstrike2exp1 Put Buy1putstrike2exp1 Sell2putstrike1exp1
Ratio 1x3	13	Call Buy1callstrike1exp1

Options		
Strategy Type	Type Code	Construction
		Sell3callstrike2exp1 Put Buy1putstrike2exp1 Sell3putstrike1exp1
Ratio 2x3	23	Call Buy2callstrike1exp1 Sell3callstrike2exp1 Put Buy2putstrike2exp1 Sell3putstrike1exp1
Strip	SR	Call Buy1callstrike1exp1 Buy1callstrike1exp2 Buy1callstrike1exp3 Buy1callstrike1exp4 Put Buy1putstrike1exp1 Buy1putstrike1exp2 Buy1putstrike1exp3 Buy1putstrike1exp4
Risk Reversal	RR	Buy1callstrike2exp1 Sell1putstrike1or2exp1
Straddle Strips	SS	Buy1callstrike1exp1 Buy1putstrike1exp1 Buy1callstrike1exp2 Buy1putstrike1exp2 Buy1callstrike1exp3 Buy1putstrike1exp3 Buy1callstrike1exp4 Buy1putstrike1exp4
Xmas Tree	XT	Call Buy1callstrike1exp1 Sell1callstrike2exp1 Sell1callstrike3exp1 Put Buy1putstrike3exp1 Sell1putstrike2exp1 Sell1putstrike1exp1
3-Way	3W	Call Buy1callstrike2exp1 Sell1callstrike3exp1 Sell1putstrike1exp1 Put Buy1putstrike2exp1 Sell1putstrike1exp1 Sell1callstrike3exp1
Iron Butterfly	IB (eye-B)	Sell1putstrike1exp1 Buy1putstrike2exp1 Buy1callstrike2exp1 Sell1callstrike3exp1

Options		
Strategy Type	Type Code	Construction
Jelly Roll	JR	Buy Sell1callstrike1exp1 Buy1putstrike1exp1 Buy1callstrike2exp2 Sell1putstrike2exp2 Sell Buy1callstrike1exp1 Sell1putstrike1exp1 Sell1callstrike2exp2 Buy1putstrike2exp2
Guts	GT	Buy1callstrike1exp1 Buy1putstrike2exp1
3-way: Straddle versus Call	3C	Buy1callstrike1exp1 Buy1putstrike1exp1 Sell1callstrike2exp1
3-way: Straddle versus Put	3P	Buy1callstrike1exp1 Buy1putstrike1exp1 Sell1putstrike2exp1

Revision History

Date	Version	Author	Description
1/10/2011	2.0	blf	Corrected 'sell the spread' example for FX calendar spread so that front leg has later maturity
1/19/2011	2.3	cr	Removed acronym used for Theoretical Opening Price.
2/1/2011	2.4	blf	<ul style="list-style-type: none"> Updated GTC/GTD order type submitted outside price band example Updated Settlement descriptions
2/18/2011	2.5	blf	Updated settlement descriptions
3/23/2011	2.6	blf	Added section "11.3 Identification of CME Globex Terminal Operators – Tag 50"
4/1/2011	2.7	cr	Changed section 8.1, Market States and Order Activity Restrictions. Remove the phrase indicating Order Entry is not allowed in the No Cancel state.
4/6/2011	2.8	cr	3.2.2 Reduced Tick – removed reference that RT is unique to CME Group US Treasury markets. Also a note was added to 4.3 Order Display Quantity that CME Interest Rate Options are not available.