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CQG Spreader

CQG Spreader is CQG’s solution for creating, managing, and trading multi-leg, intermarket, and cross-exchange spreads.

CQG Spreader offers:

- Smart, proprietary algorithms that manage working spread legs for you with maximum efficiency.
- Execution in less than a millisecond by CQG exchange-collocated spread servers.
- Ultra-low latency no matter where you are on the globe.
- First in, first out queue management by CQG spreader servers that ensures that CQG customers placing competing orders don’t interfere with each other and prevents them from getting hung.

You can:

- Trade across multiple accounts, helpful for either multiple commodities or multiple customers.
- Set up spreads with up to forty legs and actively quote up to ten legs.
- Configure leg ratios, scale, and legging risk.
- Prioritize leg placement.
- Readily identify spreads and their legs on the DOMTrader through special color-coding.
- Trade outrights.
- Spread Globex-listed options.

About this Document

This guide details getting started with and using CQG Spreader. This document assumes a general knowledge of CQG IC trading applications, so information included herein refers to spread trading only.

Please note that images are examples only and are meant to demonstrate and expose system behavior. They do not represent actual trading situations.

This guide is meant to be printed double-sided, which results in blank pages in the pdf.

The most recent version of this document is always here:

Related Documents

- CQG Tradable Symbols (www.cqg.com/Docs/Symbols.pdf)

Customer Support

If you need assistance with CQG Spreader, please contact our customer support team at 1-800-748-3502 or spreadersupport@cqg.com. If you are calling from outside the United States, please use our UK number +44 (0) 20-7827-8289.
Getting Started

Upgrading to a 13.58 Version of CQG Integrated Client

2. Click CQGIC, then click Pilot, then click the most recent version of 13.58.
3. Click Run. You can also save the file to your computer and open it from there.
4. If you receive a verification message, click Run.
5. Follow the installation wizard to complete the installation of this version.

Mitigating Messaging to a Futures Exchange

With the introduction of the messaging efficiency program by CME®, some of our Spreader customers may be interested in customizing CQG Spreader messaging parameters.

Please see Setting Messaging Parameters for details about each of these parameters.

Read about the CME Messaging Program:

Read about CME Benchmark Ratios:

Important Note about Pre-Open Trading

CQG does not recommend spread trading during the pre-open, as pre-open trades are higher risk trades.

Please be aware that trading during the pre-open may result in unwanted or incomplete fills. Possible scenarios include:

- If the markets are aligned in such a way that all leg orders in a spread can be filled immediately, those orders are placed even if only one leg is open.
- Exchanges may employ pre-open algorithms to freeze legs, which prohibits modification and cancellation.

Before placing pre-open orders, please contact your account representative to ensure your understanding of pre-market conditions.
Trading Multiple Accounts

If you trade multiple accounts, it’s important that you understand how changing the account impacts other trading windows.

When the spread and its legs are displayed (for example: DOMTrader DSX-PIL, DOMTrader DSX, and DOMTrader PIL):

- If you change the account in the spread (DSX-PIL), then the account changes for all open legs (DSX, PIL).
- If you change the account on one leg (DSX), the account for the spread (DSX-PIL) and other leg (PIL) do not change.

Calculating Positions of Synthetic Spreads

The open position of a synthetic spread is calculated as the maximum order size that could result given the existing size of the open position of the spread legs.

All legs must have an open position for the spread to have an open position.

An open position is liquidated by a spread order, unless the spread has aggregation legs, with the order size equal to the open position size.

Position calculation examples

DOWN = round down
UP = round up
MATH = round mathematically

A: 10L, B: 10S

\[
\text{SPREAD}(A-B,,,1:3.5,,,\text{DOWN})
\]

\[
\text{DOWN}(3\times3.5) = 10
\]

Open position: 3L

\[
\text{SPREAD}(A-B,,,1:3.5,,,\text{UP})
\]

\[
\text{UP}(3\times3.5) = 11
\]

Open position: 2L

\[
\text{SPREAD}(A-B,,,1:3.5,,,\text{MATH})
\]

\[
\text{MATH}(3\times3.5) = 11
\]

Open position: 2L
A: 10L, B: 1S

SPREAD(A-B,,1:0.25,,DOWN)
DOWN(7*0.25) = 1
DOWN(8*0.25) = 2
Open position: 7L

SPREAD(A-B,,1:0.25,,UP)
UP(4*0.25) = 1
UP(5*0.25) = 2
Open position: 4L

SPREAD(A-B,,1:0.25,,MATH)
MATH(5*0.25) = 1
MATH(6*0.25) = 2
Open position: 5L

A: 10L, B: No position

SPREAD(A-B,,1:0.25)
Open position: No position

See Also: Spread Position Calculation by Execution
**Spreader Components on Trading Applications**

Before setting up and trading spreads, it’s helpful to understand the spread trading components on our order placement applications. Those applications include: Order Ticket, Order Desk, and DOMTrader.

**Order Ticket Components**

When you enter a spread on the Order Ticket, CQG Spreader components are added to it, and the Order Ticket background color changes. This color changes for each spread. You can change the default color using parameters.
**Spread tab**

The spread tab displays the formula that you entered on the Order Ticket. If you entered a QFormula directly, then this tab displays either the name, number, or formula depending on your preferences (CQG IC Preferences > Symbol > Preferred QFormula display format). QFormulas are especially helpful with complex spread strategies.

If the formula is a QFormula, right-click the tab to edit it. To create a QFormula from the formula you entered, right-click the tab. The next available QNumber is automatically assigned to the spread, and it is displayed on the tab.

Hover your mouse over the tab to display a tooltip with the spread formula:

**Legs button**

Click the **Legs** button to display (or hide) an Order Ticket for each of the spread legs in addition to the Order Ticket for the spread. Gray = off. Orange = on.

The legs of spreads that are tabs on the same Order Ticket will also be tabs on the same Order Ticket. For example, suppose you have an Order Ticket with two spread tabs: EP-ENQ and CLE-ET. You click **Legs** for EP-ENQ, and two Order Tickets open, one with an EP tab and another with an ENQ tab. If you then click **Legs** for CLE-ET, then CLE opens as the next tab on the EP Order Ticket and ET opens as the next tab on the ENQ Order Ticket.

**Trade ratio field**

Type a trade ratio in this field. When you do, the Order Ticket background color changes because the system considers this a new spread formula. This field is populated automatically with the value set in calculation parameters for QFormulas. Fractional trade ratios are allowed. For example: SPREAD(1.6*FVAU2-USAU2, , ,1.6:1).
Working leg menu

On this menu, you choose which of the spread legs to work first: Most liquid (TYA), Least liquid (USA), or All legs, which works both simultaneously.

To remove the check mark near a selection, click the menu item again.

This menu is a quick way to make changes to working legs. You can also choose the leg to work on the parameters window.

Clicking Set up parameters opens the parameters window.

Complete spread menu

On this menu, select Market or Limit for the second working leg.

This menu provides a quick way to make changes. You can also choose the order type for the second working leg on the parameters window.

Clicking Set up parameters opens the parameters window.
**Order duration menu**

**DAY** is the default order type on this menu. If a day order is unfilled at the close of the trading session, it is automatically cancelled.

Iceberg orders are limit day orders that have both a total quantity and a display quantity that is shown publicly on the order book.

If you select **ICBG strategy**, this option is off and the quantity is not replenished until the leg is completely filled. If you select **ICBG leg**, then the order quantity is replenished on the filled leg immediately upon receiving primary fill.

Clicking **Set up parameters** opens the [parameters window](#).

**Spreads button**

This button is located on the leg Order Tickets.

Off (gray button) = Show outrights

On (orange button) = Show all orders for that symbol
**Order Desk (Beta) Components**

CQG has added a trading application, Order Desk, to our current suite of order placement and management tools. This tool provides flexibility to those traders who prefer to use separate applications for market data and order placement. Link Order Desk to any of CQG’s market monitoring tools.

Display settings provide incredible versatility, allowing you to choose the components you wish to display, the placement of those components on the window, and the tab order for those components. Order Desk also fully supports keyboard trading.

Order Desk requires an enablement.
DOMTrader Components

The Order Ticket spreader components are also present on the DOMTrader. The DOMTrader has one additional component, a Spreader icon.

This large S icon is not functional; it indicates that the DOMTrader is in CQG Spreader mode.

The DOMTrader works in much the same way as the Order Ticket; clicking the Legs button opens a DOMTrader for each leg.

The DOMTrader requires an enablement.
Setting Up Spreads: Symbology

The first step in setting up spreads, prior to setting calculation parameters and trading preferences, is understanding how to write a spread formula.

You can use either common or extended notation, which are explained later in this section. You can also add net change and yield operators to the spread formula.

This section offers the specifics you need to write even the most complex synthetic spread formulas.
## Common Spread Examples

These formulas are some of the more commonly used spreads.

<table>
<thead>
<tr>
<th>Description</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-year T-notes v. T-bonds (NOB)</td>
<td>SPREAD(1.6*TYA-USA,,,5:3)</td>
</tr>
<tr>
<td>5-year T-note v. T-bonds (FOB)</td>
<td>SPREAD(2.5*FVA-USA,,,5:2)</td>
</tr>
<tr>
<td>5-year T-notes v. 10-year T-notes (FYT)</td>
<td>SPREAD(1.5*FVA-TYA,,,3:2)</td>
</tr>
<tr>
<td>Crude Light v. Brent Crude</td>
<td>SPREAD(CLE-ET)</td>
</tr>
<tr>
<td></td>
<td>Compares the price of crude that uses physical delivery for settlement (CLE) versus the price of crude using financial settlement (ET).</td>
</tr>
<tr>
<td>E-Mini S&amp;P 500 v. E-Mini NASDAQ 100</td>
<td>SPREAD(0.5<em>EP-0.2</em>ENQ)</td>
</tr>
<tr>
<td>Euro STOXX 50 v. CAC-40 Index</td>
<td>SPREAD(1.25*DSX-PIL,,,5:4)</td>
</tr>
<tr>
<td>Euro STOXX 50 v. DAX Index</td>
<td>SPREAD(1.64*DSX-DD,,,4:2)</td>
</tr>
<tr>
<td></td>
<td>SPREAD(1.6*DSX-DD,,,4:1)</td>
</tr>
<tr>
<td>Eurodollar v. 5-year T-note</td>
<td>SPREAD(1.6*EDA-FVA,,,5:3)</td>
</tr>
<tr>
<td>Gasoil v. Brent Crude</td>
<td>SPREAD(QP/7.45-QO,,,4:3)</td>
</tr>
<tr>
<td></td>
<td>Ratio changes based on how the yield curve moves with changes in the Basis Point.</td>
</tr>
<tr>
<td>Heating Oil v. Crude Light (heat crack)</td>
<td>SPREAD(HOE*42-CLE, L2)</td>
</tr>
<tr>
<td></td>
<td>Compares crude and heating oil barrel to barrel.</td>
</tr>
</tbody>
</table>

## Options

<table>
<thead>
<tr>
<th>Description</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYA March 2012 Vertical Call Spread</td>
<td>SPREAD(C.TYAH213000-C.TYAH213050,,, BA:BA)</td>
</tr>
<tr>
<td>Description</td>
<td>Formula</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>TYA March 2012 Vertical Put Spread</td>
<td>SPREAD(P.TYAH213000-P.TYAH213050, , , BA:BA)</td>
</tr>
<tr>
<td>TYA March 2012 Call Butterfly Spread</td>
<td>SPREAD(C.TYAH213000-2*C.TYAH213050+C.TYAH213100, , 1:2:1, BA:BA:BA)</td>
</tr>
<tr>
<td>TYA March 2112 Put Butterfly Spread</td>
<td>SPREAD(P.TYAH213000-2*P.TYAH213050+P.TYAH213100, , 1:2:1, BA:BA:BA)</td>
</tr>
</tbody>
</table>

Note that some examples may change over time. Please check the expressions against current market conditions.
Common and Extended Notation

Spreads can be written in either extended or common notation. For example:

- common notation: EP-ENQ
- extended notation: SPREAD(EP-ENQ,L1)
- common notation: EP-ENQ*2
- extended notation: SPREAD(EP-ENQ*2, CUR, 2.5)

Both formats can be used for QFormulas.

Extended notation spread formula:

```
SPREAD (<CQG expression>, <calculation mode>, <tick size>, <trading ratio>, <BAT filter>, <rollover>, <rounding>)
```

For example: SPREAD(HOE-CLE, L1, 0.01, 1:2.5, T:BA, 1, MATH)

For options, the CQG expression includes a spread formula where both sides are formatted as:

- `<C or P>`.`<commodity prefix>`<instrument symbol>`<month code>`<two-digit year code>`<strike price>`

For example: SPREAD(C.EU6Z113000-P.EU6Z113000)

Parentheses should include everything in the spread equation that follows SPREAD.

Each component should be separated by a comma. If a component is not included in your spread equation, but the following component is, you should include a comma for the first component. Spaces are optional.

For a comprehensive discussion of spread formulas, please see Additive and Multiplicative Formulas.

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CQG expression</td>
<td>Names the symbols and the optional multipliers for the spread. Each element of the expression can consist of one symbol and one multiplier. Same as common notation.</td>
</tr>
<tr>
<td></td>
<td>For example: 0.5<em>EP-0.2</em>ENQ, 42<em>HOE-CLE, 1.6</em>FVA-USA, CLE-ET</td>
</tr>
<tr>
<td>Calculation mode</td>
<td>Identifies how you would like the spread calculated, by legs or currency. Allowed values:</td>
</tr>
<tr>
<td></td>
<td>L1, L2, L3, etc. = Displays price based on tick value of leg selected.</td>
</tr>
<tr>
<td></td>
<td>CUR = Displays the price based on the full currency values of the legs. Consider E-Mini S&amp;P versus E-Mini NASDAQ 100 using a one contract leg-to-leg ratio. The dollar value of the E-Mini S&amp;P is the price multiplied by $50. If the price of the futures contract is 1097.25, then the value of the contract is $54,862.50 (1097.25 * $50). The dollar value of the E-Mini NASDAQ 100 is the price multiplied by $20. If the price of the futures contract is 1798.00, then the value of the contract is $35,960 (1798.00 * $20). If you calculate EP-ENQ with CUR selected, the price displayed is $18,902.50 ($54,862.50-$35,960.00).</td>
</tr>
<tr>
<td>Component</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>In the case of a spread where two legs trade in different currencies, adjust the expression to the appropriate currency using a conversion ratio, such as today’s exchange rate, as currency is calculated as a raw number and not as a monetary value in a base currency. For example, consider the DAX Index that trades in Euros versus the E-Mini S&amp;P that trades in dollars. To adjust for Euro: SPREAD(DD-EP/1.5,CUR). For USD: SPREAD(1.5*DD-EP,CUR).</td>
</tr>
<tr>
<td></td>
<td>Price for spreads that include cash instruments inherit their formatting from the leg that is used for tick size calculation. For example, SPREAD(BUS02-TUA) is formatted in the same way as BUS02. If the calculation mode is changed to L2, then spread price is formatted in the same way as TUA. If you define the tick size, then the price is formatted as a rounded decimal. Applies to Order Ticket and DOMTrader only.</td>
</tr>
<tr>
<td></td>
<td>Default = L1</td>
</tr>
<tr>
<td>Tick size</td>
<td>Specifies the spread tick size. If all legs either have an equal tick size or are for the same contract, then the tick size is the spread tick size. If the tick size is not specified, then the spread tick size for leg mode is equal to the leg tick size. Specify tick size in binary format as well as decimal format. Allowed values: ½, ¼, ⅛, 1/16, 1/32, 1/64, 1/128, 1/256, 1/512, 1/1024, 1/2048, ⅛ of 1/64, ⅛ of 1/32, ¼ of 1/32, ½ of 1/32. For example, SPREAD (USA*2 - ENQ,, 1/4 1/32). Some of the smallest tick sizes must be entered manually, as they are not available in the tick size menu. For currency mode, the tick size represents the greatest common denominator (GCD) of leg tick values or the minimum tick value if the GCD is not applicable. For example: SPREAD (ZSE-ZME, CUR). GCD (12.5, 10) = 2.5. 2.5 is the largest number both 12.5 and 10 are divisible by.</td>
</tr>
<tr>
<td>Trading ratio</td>
<td>Specifies the order quantity for each leg in this format: leg one:leg two:leg three. Values can be fractional. Fractional values can have six integers (0-9) both before and after the decimal, nnnnnn.nnnnnn. For example: SPREAD (EP<em>2-ENQ,,,2:1) SPREAD (1.6</em>TYA-USA,,,5:3) SPREAD ( EP - ENQ, , , 1 : 0 ) SPREAD ( EP - ENQ, , , 1.5 : 2.999999 ) Default = 1:1</td>
</tr>
<tr>
<td>Component</td>
<td>Description</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
</tr>
<tr>
<td>BAT Filter</td>
<td>Each leg has a BAT (Bid/Ask and Trade) filter. Separate the filter for each leg with a colon. For example: SPREAD ( EP * 2 - ENQ , , , BA : T ) SPREAD ( EP - ENQ + TYA , , , T : BA : BA ) Allowed values: BA = If leg side is buy, leg ask price is used for spread ask price calculation and leg bid price is used for spread bid price calculation. If leg side is sell, leg ask price is used for spread bid price calculation and leg bid price is used for spread ask price calculation. T = Trades of the given leg are used for both synthetic spread ask and bid prices calculation. B = Leg ask price is used for spread ask price calculation and leg bid price is used for spread bid price calculation. Default = BA</td>
</tr>
<tr>
<td>Rollover</td>
<td>If turned on, when one leg expires, all legs roll over to the same month. Allowed values: 0 = Same month rollover is turned off. 1 = Same month rollover is turned on. Default = 0</td>
</tr>
<tr>
<td>Rounding</td>
<td>Using a fractional trade ratio may result in fractional lots. If so, the number of lots has to be rounded. This parameter indicates how to round: up, down, or mathematically. Rounding applies only to complex strategies with fractional trade ratios. Rounding applies to positive numbers. If used with a negative value, then rounding is applied to the absolute value and then the sign is changed. Please note that rounding impacts spread BBA volume, aggregation DOM volume, and aggregation trade volume. Allowed values: DOWN = always round down UP = always round up MATH = round up when fractional part is 5 or greater; round down when fractional part is less than 5</td>
</tr>
</tbody>
</table>
Additive and Multiplicative Formulas

For our purposes, “additive” formulas contain only addition and subtraction between legs. “Multiplicative” formulas contain multiplication and division between legs. Multiplicative formulas can be used with additive formulas. For example:

```
SPREAD(A - SPREAD(B/C))
```

These formulas have several useful applications, especially when trading arbitrage strategies and ratio of prices instead of difference.

They can be used with:

- Alerts
- Charts
- DOMTrader
- Monitors
- Order Ticket
- Orders & Positions
- Quotes
- Simple Order Ticket
- SnapTrader

Multiplicative formulas can be used in conjunction with aggregation but not with yield and net change.

Additive formulas

Only addition and subtraction operations can be used between spread legs in additive formulas. Formulas can include offsets. For example:

```
EP * 2 - ENQ
SMA * 0.022 + ZLE * 11 - ZSE
EP - ENQ + 100.0
```

These additional rules apply:

- Every leg of the expression must include only one contract symbol and one constant multiplier.
  Incorrect: EP * DD - ENQ
- Multipliers are positive or negative values.
  Correct: 2 * ENQ - 4 * DD - EP
- Multipliers can be used in divisor form.
  Correct: EP - ENQ * 0.5 or EP - ENQ / 2

See also: Net Change and Yield Spreads
**Multiplicative formulas**

Only multiplication and division operations can be used between spread legs in multiplicative formulas.

A leg multiplier must be a positive value. For example:

\[
\text{SPREAD}(3.42 \times A / (21 \times B))
\]

\[
\text{SPREAD}(A / (5 \times B) / C)
\]

A multiplicative formula should include only those parentheses that contain one leg with its multiplier. The system removes all other parentheses. If the formula cannot be preserved without changing the order of legs, then the formula is rejected. For example:

\[
\text{SPREAD}(A \times B / (C \times D)) \text{ becomes } \text{SPREAD}(A \times B / C / D)
\]

\[
\text{SPREAD}(A \times B / (C / D)) \text{ becomes } \text{SPREAD}(A \times B / C \times D)
\]

Traders should explicitly nest strategies. For example:

\[
\text{SPREAD}(\text{EP} \times (\text{TUA} - \text{TYA})) \text{ should be } \text{SPREAD}(\text{EP} \times \text{SPREAD}(\text{TUA} - \text{TYA}))
\]

\[
\text{SPREAD}(A \times B / (C \times D)) \text{ should be } \text{SPREAD}(A \times B / \text{SPREAD}(C \times D))
\]

Please note that nested strategies cannot be expressed in simple notation. For example:

Correct: A \times B / C \times D

Correct: EP \times ENQ

Correct: RBE / CLE

Incorrect: A \times B / (C \times D)

Incorrect: EP \times (TUA - USA)

For buy spreads, legs used as multipliers are bought, and legs used as divisors are sold. Consider these examples from the buying perspective:

\[
\text{SPREAD}(A / B) \text{ buy A, sell B}
\]

\[
\text{SPREAD}(A \times B) \text{ buy A, buy B}
\]

\[
\text{SPREAD}(A \times B / C) \text{ buy A, buy B, sell C}
\]

\[
\text{SPREAD}(A \times B / C / D) \text{ buy A, buy B, buy C, buy D}
\]

\[
\text{SPREAD}(A / B / C / D) \text{ buy A, sell B, sell C, sell D}
\]

**With parameters**

Calculation mode, tick size, trade ratio, BAT filter, and roll-over parameters can be used with multiplicative formulas. For example:

\[
\text{SPREAD ( EP \times 2 - ENQ )}
\]

\[
\text{SPREAD ( SMA \times 0.022 + ZLE * 11 - ZSE, L3 )}
\]

\[
\text{SPREAD ( SMA \times 0.022 + ZLE * 11 - ZSE, L3, , 10:11:9 )}
\]
Tick size is not calculated automatically for spread formulas. If a spread tick size is specified explicitly, it is used regardless of leg tick sizes. When tick size is not specified:

- For both additive and multiplicative formulas in currency calculation mode, tick size of the first leg converted to the currency is used as spread tick size.
- For both additive and multiplicative formulas in leg calculation mode (L1, L2, etc.), tick size of the specified leg is used.

**With aggregation**

The AGGR() expression can be used with any leg of a multiplicative formula. For example:

\[ \text{SPREAD}(A \times \text{AGGR}(2 \times B \& C) / D) \]

Also, multiplicative formulas can be used as any leg of aggregation expression. For example:

\[ \text{AGGR}(A \& \text{SPREAD}(B / C / D)) \]

**As applied to arbitrage**

To spread two similar commodities quoted in different currencies, traders can convert those commodities to one currency. For example, consider FSUGR and SBE. FSUGR, traded on RTS, is quoted in rubles. SBE, same spec traded on ICE, is quoted in dollars.

You can use FUS, which is futures on USD quoted in rubles (USD/RUR), to convert the sugar price in dollars to rubles. This spread expression is sugar quoted in rubles (2.2046 ratio used to convert pounds to tons):

\[ \text{SPREAD}(2.2046 / 100 \times SBE \times FUS / 1000). \]

Now, you can arbitrage these two sugar contracts:

\[ \text{SPREAD}(\text{FSUGR} - \text{SPREAD}(2.2046 / 100 \times SBE \times FUS / 1000)) \]

Or use aggregation to buy sugar on both exchanges:

\[ \text{AGGR} (\text{FSUGR} \& \text{SPREAD}(2.2046 / 100 \times SBE \times FUS / 1000)) \]

**As applied to trading using ratio instead of difference**

You can trade Gasoline/Crude Oil, Gold/Silver, Gold/Crude as well as other well-known ratios. For example:

\[ \text{SPREAD}(\text{RBE}/\text{CLE}) \]

Buying this gasoline-crude spread enables you to buy RBE and sell CLE.

According to bid/ask calculation rules, bid/ask quotes are calculated as RBE divided by CLE.
Net Change and Yield Spreads

Net change and yield are calculated as if all of the legs are wrapped in Yield operator, so that these calculations are identical:

\[ \text{YIELD} (\text{SPREAD}(\text{leg1} - \text{leg2} + 5)) \]
\[ \text{SPREAD} (\text{YIELD}(\text{leg1}) - \text{YIELD}(\text{leg2}) + 5) \]

And these calculations are identical:

\[ \text{NC} (\text{SPREAD}(\text{leg1} - \text{leg2} + 5)) \]
\[ \text{SPREAD} (\text{NC}(\text{leg1}) - \text{NC}(\text{leg2}) + 5) \]

Offsets are calculated as is.

Net Change

You can trade spreads based on net change, the difference between today’s current price and the settlement price. Order duration is limited to DAY, but all order types are supported.

Symbology:

By QFormula: NC(Q1)

By spread: NC(EP-ENQ), which is the same as NC(EP)-NC(ENQ)

By leg: NC(EP)-ENQ
Net change formulas are identified on the tabs. Note the net change quotes on the DOM ladder for each leg. You can apply net change to a spread using the Setup Synthetic Spread Calculation Parameters window.

Yield

You can trade spreads based on yield for cash symbols. You can trade any order type. Outrights can be traded with any duration. For spreads, only day orders are accepted.

Symbology:

By QFormula: YIELD(Q1)
By spread: YIELD(CUS10-CUS30) which is the same as YIELD(CUS10)-YIELD(CUS30)
By leg: YIELD(CUS10)-CUS30

Yield formulas are identified on the tabs. Instead of price in the price column, the difference in yield is displayed. Yields for the legs are displayed in the right-most column of the DOM ladder. You can change the location of the column in Trading Preferences.

You can apply yield to a spread using the Setup Synthetic Spread Calculation Parameters window.
Synthetic Butterflies

Using crude as an example, there are two ways to enter synthetic butterflies:

- \( \text{SPREAD} (\text{CLEM}-2\times\text{CLN}+\text{CLEQ},,,1:2:1) \)
- \( \text{SPREAD} (\text{CLES1M}-\text{CLES1N}) \)

The first formula results in outright leg orders, while the second results in native calendar spread orders. The second formula is generally preferable, as it could have less leg and overfill risk, a tighter bid /ask, and more liquidity, but it may not be appropriate in all cases. Placing trades yields the same result no matter which formula you choose.
Setting Up Spreads: QFormulas

While spreads can be set up and traded directly on CQG’s trading applications, it’s best to create a spread QFormula.

Complex spreads are more easily entered on trading applications by typing a QNumber than by typing a complicated formula. They are also easily entered on a chart of Quote SpreadSheet.

QFormulas are easily copied, so that you can apply different parameters to the same spread expression.

Create descriptions for your QFormulas and group them in folders to better organize and manage them.

QFormulas are created on the Define User Formulas window.
Working with the Define User Formulas Window

Formulas are created in the Formula Editor on the Define User Formulas window. You can:

- Type complete formulas (extended notation) directly into the editor using system-provided tips for guidance.
- Apply the Spread function found in the Toolbox to a simple expression.
- Use synthetic spread calculation parameters to add parameters to common notation.
Creating Spread QFormulas

To create a spread formula:

1. Click the Formula button to open the Define User Formulas window.
2. Click the QFormulas tab.
3. Click the New button.
4. Type a name for the QFormula.
5. Click OK. The new QFormula is displayed in the list, and the next QNumber in the series is automatically assigned to it. Click the arrow to change the QNumber, or type a new number.
6. Enter your spread strategy in the Formula Editor. As soon as you have typed SPREAD( the system displays the spread formula and an example to assist you. Replace the @ in SPREAD( with your strategy.

Alternatively, you can enter the common notation (e.g. CLE-ET), and then apply the Spread function.

7. If you prefer to select calculation settings using a parameters window instead of typing them into the formula editor, click the Setup button. This button is active when the spread formula is selected.

The Setup Synthetic Spread Calculation Parameters window opens. Make your selections, and then close the window.

This is also the way to apply net change and yield to the spread formula.

8. Click the Trading Execution Patterns button to set trading parameters. Choose which legs to work, the order type, volume ratio, stacked orders parameters, and incomplete order behavior.

9. Close the Define User Formulas window. Now, you’re able to enter the QFormula number directly on the DOMTrader and Order Ticket.

It will be displayed as a number, name, or formula depending on your display format setting.

In the Formula Editor, when you hover your mouse over a part of the strategy, a tooltip is displayed. That tooltip identifies the element of the formula you’re pointing to. For example, in this image, the mouse is pointing to the trade ratio.
Setting Synthetic Spread Calculation Parameters (Setup Button)

Click the **Setup** button to open the calculation parameters window. If the **Setup** button is not active, make sure the spread formula is selected in the Formula Editor.

Changes entered here are reflected in the spread formula in the editor. For example, \( \text{SPREAD(CLEH2-CLEJ2,L1)} \) becomes \( \text{SPREAD(CLEH2-CLEJ2,CUR)} \) if you change the calculation mode to currency.

By selecting **Yes** for **Yield**, \( \text{SPREAD(1.6*TYA-USA, , , 5:3)} \) becomes \( \text{SPREAD(1.6*YIELD(TYA)-YIELD(USA), , , 5:3)} \).

**Field definitions**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Calc Mode</strong></td>
<td>Identifies how you would like the spread calculated, by legs or currency.</td>
</tr>
<tr>
<td></td>
<td><strong>Auto</strong> = Displays difference in price between symbols.</td>
</tr>
<tr>
<td></td>
<td><strong>L1, L2, L3</strong>, etc. = Displays price based on tick value of leg selected.</td>
</tr>
<tr>
<td></td>
<td><strong>CUR</strong> = Displays the price based on the full currency values of the legs.</td>
</tr>
</tbody>
</table>

Consider E-Mini S&P versus E-Mini NASDAQ 100 using a one contract leg-to-leg ratio. The dollar value of the E-Mini S&P is the price multiplied by $50. If the price of the futures contract is 1097.25, then the value of the contract is $54,862.50 (1097.25 * $50). The dollar value of the E-Mini NASDAQ 100 is the price multiplied by $20. If the price is of the futures contract is 1798.00, then the value of the contract is $18,902.50 (1798.00 * $20). If you calculate EP-ENQ with CUR selected, the price displayed is $18,902.50 ($54,862.50-$18,902.50).

In the case of a spread where two legs trade in different currencies, adjust the expression to the appropriate currency using a conversion ratio, such as today’s exchange rate, as currency is calculated as a raw number and not as a monetary value in a base currency. For example, consider the DAX Index that trades in Euros versus the E-Mini S&P that trades in dollars. To adjust for Euro: \( \text{SPREAD(DD-EP/1.5,CUR)} \). For USD: \( \text{SPREAD(1.5*DD-EP,CUR)} \).
<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
</table>
| Rollover       | If turned on, when one leg expires, all legs roll over to the same month. Allowed values:  
|                | OFF = Same month rollover is turned off.  
|                | ON = Same month rollover is turned on.  
|                | Default = OFF.                                                                                                                                     |
| Tick Size      | Use **Auto** or enter a tick size value.  
|                | **Auto** = Uses L1 tick size for spread tick size.  
|                | 5 = Uses 5 as the tick increment.  
|                | 10 = Uses 10 as the tick increment.  
|                | Default = Auto.                                                                                                                                   |
| Trade Strategy | Opens the [trading parameters window](#).                                                                                                          |
| BAT filter     | You can have the system select bid/ask or trades or you can make the selections yourself for each leg.  
|                | **Spread**  
|                | **Auto** = Tells the system to use bid/ask data if available, otherwise trade data. Default.  
|                | **By Legs** = Indicates that you will make the data selection for each leg.  
|                | **Leg**  
|                | **Bid/Ask** = If leg side is buy, leg ask price is used for spread ask price calculation and leg bid price is used for spread bid price calculation. If leg side is sell, leg ask price is used for spread bid price calculation and leg bid price is used for spread ask price calculation. Default.  
|                | **Bid/Bid** = Leg ask price is used for spread ask price calculation and leg bid price is used for spread bid price calculation.  
|                | **Trade** = Trades of the given leg are used for both synthetic spread ask and bid prices calculation.                                                                |
| NC             | Select **Yes** to quote by net change instead of price.                                                                                           |
| Yield          | Select **Yes** to quote by yield instead of price.                                                                                               |
Using the Spread Function (Toolbox Button)

This function can be used as a starting point to create a spread formula (insert) or as a way to change an existing formula to a spread (apply) in the Formula Editor. See Common and Extended Notation and Net Change and Yield Spreads, for the definitions of parameters.

To insert this function

1. Click the Toolbox button.
2. Navigate to the Spread function.
3. Click the Insert button.
4. Close the window. The formula looks like this in the Formula Editor:

```
/*SPREAD(linear expression, [calculation mode], [tick size], [trade ratio], [BAT filter], [roll-over], [rounding mode])
Examples
SPREAD(MY_NAME, L1, 0.01, 12, TBA, 1)
SPREAD(EP-ENG, L1, 0.01, 11.33, TBA, 1, MATH)
SPREAD(EP-ENG)*7
SPREAD()*/
```

The text between /* and */ is the comment area.
5. Replace the @ with the formula, like you see in the example.
To apply this function

1. Highlight the expression in the Formula Editor (HOE-CLE, for example).
2. Click the Toolbox button.
3. Navigate to the Spread function.

![Formula Toolbox]

4. Click Apply.
5. Close the window. The formula looks like this in the Formula Editor:
Setting Trading Parameters

There are several ways to open the **Setup Trading Parameters** window:

- On the Define User Formulas window, click the **Trading Execution Patterns button**, or click the **Setup button** and then click the **Trade Strategy field**.
- Click the **Params** button on the Order Ticket or DOMTrader toolbar.
- Right-click the color-coded area on the Order Ticket or DOMTrader, and then click **Set parameters**.
- Press **CTRL+M** from the Order Ticket or DOMTrader.
- Click **Set up parameters** on the **working leg menu**.
- Click **Set up parameters** on the **complete spread menu**.

**Calculation parameters**, such as tick size and BAT filter, must be selected as part of the QFormula.
Working with the Set Up Trading Parameters Window

There are two primary sets of actions for this window: changing parameters that impact the way your spread is traded and making changes to the trading parameters window itself.

To change numerical parameters

The parameter fields are either buttons, check boxes, or fields that contain numbers. To change those numbers, you can:

- type a new value in the field; or
- click the field and use your mouse wheel to increase and decrease the value.

To restore default values

When you change the default value of a parameter, the Reset button becomes active and a small colored triangle appears to the left of the section heading:

To return to the default, click Reset.

To change the parameter window’s font size

1. Right-click anywhere on the window.
2. Click the font size you want: Extra small, Small, Medium, and Large.
To collapse and expand sections

- Click the arrows on the left of the section heading to collapse and to expand the sections. **CTRL+click** expands the section and collapses the others.

- Double-click the top-left empty cell to expand all sections.

Other actions

- Click the **QFormula** button at the bottom of the window to open the Define User Formulas window.

- Click the checkbox to apply these settings to all open trading windows for this strategy.

- Click the question mark to read more about the parameter.
## Setting Spread Properties

### Parameter | Description
--- | ---
Color | Click the color button to open a standard color selector. (You can also right-click the color-coded area on the Order Ticket, and then click **Set color**.)
Overfill management | It is possible to get overfilled when legs are being worked aggressively. Suppose you are working a 5-lot spread of 1:2, looking to be filled at 5:10. In actuality, you are filled at 7:10. This parameter specifies how to manage this overfill.
- **No selection**: Indicates that the trader manages the overfill and that the system should take no action.
- **Auto Hedge Overfills**: Indicates that when either the working or leaning leg is overfilled, the system should try to maintain the leg ratio. In this example, the result is an order for four lots on the second leg.
  
  In the case where you are overfilled one lot on the second leg, 5:11 for example, the system cannot hedge the spread because maintaining the ratio would require a half-lot order on the first leg.
- **Avoid Overfills**: Indicates that the system should minimize the chance for an overfill to occur by working legs less aggressively. Specifically, the system waits for the exchange to acknowledge its previous action before it adds quantity or places another order. Suitable only when working one leg of a spread.
Ignore partial fills | It’s best to explain this parameter through an example:
  
  Suppose `SPREAD(A-B,,,10:1)` is being traded with A set as the working leg, Buy 1@10. After strategy order placement, the system works a primary order on A 10@100. Market B shows a best bid of 90. The order is partially filled 3@100 on A.
  
  Market B then changes to 95, so the primary order is modified to 7@105. At this price, a second partial fill 6@105 occurs.
Market B returns to 90, and the last lot on A is filled with price 100. In total, we have 3 partial fills for the first leg: 3@100, 6@105 and 1@100.

Now the secondary order price needs to be chosen.

If **Ignore partial fills** is not checked, we calculate a secondary order price that would lead to a strategy order fill at the desired strategy price. First, the average fill price for the primary orders have to be calculated. Then, the secondary order price is calculated to satisfy the strategy price. This way of handling partial fills does help with strategy price execution, but sometimes leads to undesirable results. From our example: primary order average price = (3*100 + 6*105+1*100)/10 = 1030/10 = 103, thus secondary order price = A - S = 103-10 = 93, and a secondary order Sell 1@93 is placed. If market B shows a best bid of 1@90, that secondary order will likely hang.

If **Ignore partial fills** is checked, it tells the system to ignore fill prices on the primary orders. Instead, the secondary order is placed to hit the opposite market side. In this case, strategy price execution cannot be guaranteed, but hang probability is decreased. From our example: if market B shows a best bid of 1@91, a secondary order Sell 1@91 is placed.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market B returns to 90, and the last lot on A is filled with price 100. In total, we have 3 partial fills for the first leg: 3@100, 6@105 and 1@100. Now the secondary order price needs to be chosen. If <strong>Ignore partial fills</strong> is not checked, we calculate a secondary order price that would lead to a strategy order fill at the desired strategy price. First, the average fill price for the primary orders have to be calculated. Then, the secondary order price is calculated to satisfy the strategy price. This way of handling partial fills does help with strategy price execution, but sometimes leads to undesirable results. From our example: primary order average price = (3<em>100 + 6</em>105+1*100)/10 = 1030/10 = 103, thus secondary order price = A - S = 103-10 = 93, and a secondary order Sell 1@93 is placed. If market B shows a best bid of 1@90, that secondary order will likely hang. If <strong>Ignore partial fills</strong> is checked, it tells the system to ignore fill prices on the primary orders. Instead, the secondary order is placed to hit the opposite market side. In this case, strategy price execution cannot be guaranteed, but hang probability is decreased. From our example: if market B shows a best bid of 1@91, a secondary order Sell 1@91 is placed.</td>
<td></td>
</tr>
</tbody>
</table>
Setting How to Work Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>Indicates the size of each leg as determined by the leg ratio. Fractional values are allowed. For example: SPREAD(1.6*FVAU2-USAU2, , ,1.6:1).</td>
</tr>
<tr>
<td>Fractional Lot Size Rounding</td>
<td>Using a fractional trade ratio may result in fractional lots. If so, the number of lots has to be rounded. This parameter indicates how to round: up, down, or mathematically. Round Up: Always round up. Round Down: Always round down. Round Mathematically: Round up when fractional part is 5 or greater. Round down when fractional part is less than 5.</td>
</tr>
<tr>
<td>Work</td>
<td>Indicates the legs to work. Default = least liquid leg.</td>
</tr>
<tr>
<td><strong>Parameter</strong></td>
<td><strong>Description</strong></td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Complete strategy using</td>
<td>Identifies the order type for orders placed on this leg as a result of a working leg fill: limit (LMT), limit with offset (LMT with offset) or market (MKT). Default = LMT. Offset allowed values = -99 to 99. Default = 0. Offset is calculated in ticks. A limit with offset order is a limit order placed at the normally calculated price +/- the specified offset.</td>
</tr>
<tr>
<td>Price Level Controls</td>
<td>Ticks away to work at additional level. Defines if and where Spreader must work quantity that cannot lean onto current best bid/offer. For example, when order is to work 100 of 1:1 but only 23 is available on leaning leg, Spreader works 23 on the working leg when this parameter is set to 0. If it’s set to 2, Spreader works 23 and then additional 77 2 ticks away. Values: Default = do not override server setting Off = 0 1-9</td>
</tr>
<tr>
<td>Liquidity Controls</td>
<td>Volume Multiplier = Determines the size of working orders based on a percentage of the resting volume available in the queue of the monitored leg. For example, if set to 2, then twice as many contracts must be available in the monitored leg than the working leg. Allowed values: 0.1 to 999.9. Default = 1. Work Threshold = Tells the system to work the order if and only if the available quantity in the monitored leg is and remains greater than this value. The system works the order only for the quantity that exceeds this threshold. Example: if Working Threshold = 5 and Available Quantity = 7, then Order Quantity = 2. Allowed values: -9999 to 9999. Default = 0.</td>
</tr>
</tbody>
</table>
## Setting Messaging Parameters

These parameters help mitigate messaging:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min Size Increment</td>
<td>Applies to working orders and minimizes transaction count.</td>
</tr>
<tr>
<td></td>
<td>Tells the system to modify a working order’s quantity only if the quantity available in the monitored leg increases by at least n.</td>
</tr>
<tr>
<td></td>
<td>This parameter is applied to the working order only when the monitored available quantity increases less than n.</td>
</tr>
<tr>
<td></td>
<td>The working order size is always modified down on a decrease when the available quantity on the monitored market decreases.</td>
</tr>
<tr>
<td></td>
<td>Choose between lots and percentage. Allowed values: 1 to 9999.</td>
</tr>
<tr>
<td></td>
<td>Default = 1 lot.</td>
</tr>
<tr>
<td>Active Price Range</td>
<td>Defines the range (from best bid/best offer whichever is closest) where orders are actively worked in price increments.</td>
</tr>
<tr>
<td>Range Size</td>
<td>Values:</td>
</tr>
<tr>
<td></td>
<td>Default = do not override server setting</td>
</tr>
<tr>
<td></td>
<td>Any = no limit</td>
</tr>
<tr>
<td></td>
<td>0 = work the order if on best bid/offer only</td>
</tr>
<tr>
<td></td>
<td>1-10, 20, 30 = price increments from best bid/ask where orders will be worked/modified</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Order Action outside active range             | Determines how working legs that are far from best bid/ask are handled by the Spreader system. A working leg is considered far from best bid/ask by the number of price increments specified in Active Price Range.   | Default = do not override server setting  
Cancel working leg = cancels leg immediately if outside of range  
Work leg, update periodically = keep the order wherever it is and move it only when the time comes for a periodic update (set in Periodic Force Update)  
Work leg, update periodically, away from MKT only = keep the order wherever it is, but move the order away from the market every time it should be adjusted away, and do periodic updates to the order to move it closer to the best bid/ask when necessary |
| Min Price Change                              | Minimum price change to update the working leg order price in price increments/ticks. The Spreader system ignores any price changes that are smaller in price increments/ticks than this value. | Default = do not override server setting  
1-3 = changes in price increments                                                                                           |
| Periodic Force Update                         | Period of updates to the working leg in seconds, such that every N seconds, the leg is put where it ought to be placed based upon current prices.                                                                 | Default = do not override server setting  
1, 5, 10, 30, 60, 300, 600 = number of n seconds chosen                                                                 |
### Setting Proportional Execution Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trigger leaning leg</td>
<td>Unselect this check box to disable proportional execution in situations where you do not want the first lot of the secondary leg placed until all lots are filled on the primary leg. For example, consider a 5:3 strategy. Disabling proportional execution allows the system to fill all five lots before the three lots are triggered.</td>
</tr>
<tr>
<td>Fill size trigger</td>
<td>Indicates how many contracts (lots or percent) should be filled in the primary order before the secondary leg order is placed. For example, you’re working 10 lots of TYA and leaning on 1 million of BTC. If this setting is 50%, then the BTC leg order should be placed when 5 lots of TYA have been filled. Choose between lots and percentage. Default = 1 lot.</td>
</tr>
</tbody>
</table>
Setting Queue Holders Parameters

Queue holders (stacked orders) are additional orders placed in the queue at specified price levels away from the initial working order. Several parameters apply specifically to these stacked orders.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min and Max Number of holders</td>
<td>Used for management. Sets the minimum and maximum number of orders to include in the queue. For example, a setting of 5 and 9 indicates that the minimum number of price levels (i.e. the minimum number of stacked orders) is 5 and the maximum number of price levels is 9. The system cancels the stacked orders when a leg is filled. Risk management margin requirements are calculated assuming that all of the orders have the potential to fill. Allowed values: 1-10. Default = 1.</td>
</tr>
<tr>
<td># of levels</td>
<td>Used for queue holder management. Indicates how many price levels to skip between orders in the queue. For example, a setting of 3 indicates that an order be placed at every third price level. Allowed values: 1-5. Default = 1.</td>
</tr>
<tr>
<td>Order size restore threshold</td>
<td>Used for queue holder management. Indicates how far the market should run before maximizing size of a recently placed order that is now part of the group of stacked orders. The size of the working order is based on the currently available size in the monitored leg and the size of the orders in the group of stacked orders at the maximum order size. This setting overrides that system behavior in order to cut down on messaging. For example, a setting of 3 tells the system to update the order quantity in the queue only when the market moves 3 price levels. Default = 0. Please note that the value for this parameter must be less than the smallest number in the Number of holders field. So, if Number of holders = 5-9, then Order size restore threshold ≤4.</td>
</tr>
</tbody>
</table>
This image shows working buy and sell TYA calendar spreads. When the orders are placed, the system sends in additional orders above the best ask and below the best bid on the working order sides to maintain your position in the order queues.

This image shows orders, including stacked orders, occupy every other queue when number of levels to skip is set to two.
In this image, the number of levels is set to 2. On the working order side (USA), 1 lot was offered at 143140. The market moved down one tick, and there is now a new working order for 2 at 143130. The 1 lot offered at 143140 is not increased to 3 lots yet. A new offer has to be worked at 143120 before the 1 lot at 143140 is increased to 3 lots. This cuts down on messaging.
## Setting Incomplete Order Parameters

Using trading parameters, you can choose how the system handles incomplete orders.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replace order to complete strategy by using selected method below</td>
<td>Determines whether the system should react to incomplete orders. Used with trailing limits and payups to determine how incomplete orders should be handled (the incomplete strategy). If not selected, the system does nothing. Default = off.</td>
</tr>
<tr>
<td>Execute incomplete strategy if order is not filled in this many seconds</td>
<td>Indicates the amount of time that must elapse from acknowledgement before the incomplete strategy is executed. It allows you, for example, to wait a second to see if the market comes back. Default = 0.</td>
</tr>
<tr>
<td>Allow leg to slip this number of ticks</td>
<td>Indicates the maximum number of ticks of slippage for the incomplete strategy. Can be a positive or negative value. Also used for the offset value of payup orders, i.e. the number of ticks to modify when the payup condition (time and/or one of the leaning DOM volume options) is met. Default = 1.</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Trailing Limit, same side</td>
<td>Used with <strong>Replace order</strong>. Places a trailing limit order that tracks the same side as the incomplete order. For example, if the sell side is incomplete, then it trails the offer. If the monitor DOM volume option is selected, the DOM condition must be met before trailing occurs.</td>
</tr>
<tr>
<td>Trailing Limit, opposite side</td>
<td>Used with <strong>Replace order</strong>. Places a trailing limit order that tracks the opposite side of the incomplete order. For example, if the sell side is incomplete, then it trails the bid. If the monitor DOM volume option is selected, the DOM condition must be met before trailing occurs.</td>
</tr>
<tr>
<td>Payups</td>
<td>Used with <strong>Replace order</strong>. Replaces the original limit order to complete the spread with a limit order that has the price adjusted based on number of slip ticks. The replacement can happen based on one of the specified conditions either timeout or DOM volume.</td>
</tr>
<tr>
<td>Monitor leaning DOM volume to determine when to replace order</td>
<td>Determines whether the system should monitor leaning DOM volume. This condition must be met before the unfilled order is modified (either payup or trail it). Default = off.</td>
</tr>
<tr>
<td>Volume or volume ratio threshold</td>
<td>Contains an absolute volume if <strong>DOM Volume</strong> is selected or a volume ratio if <strong>DOM Volume to relative to order size</strong> or <strong>DOM ratio</strong> is selected. Default = 1.</td>
</tr>
<tr>
<td>DOM Volume</td>
<td>Used with <strong>Monitor leaning DOM volume</strong>. This option uses the threshold parameter as an absolute volume (allowed values 1-9999). When the leaning leg volume available at the exchange (best bid/ask, as appropriate for a leaning sell/buy order) drops below this specified volume, then the system performs a payup (replaces the original limit order to complete the spread with a limit order that has the price adjusted based on specified number of slipped ticks) or a trailing limit.</td>
</tr>
<tr>
<td>DOM Volume relative to order size</td>
<td>Used with <strong>Monitor leaning DOM volume</strong>. This option uses the threshold parameter as a volume ratio (allowed values 0.1 – 999.9). When the ratio between the volume available at the exchange (best bid/ask, as appropriate for a leaning sell/buy order) and the leaning leg order size falls below the specified ratio, then the system performs a payup (replaces the original limit order to complete the spread with a limit order that has the price adjusted based on specified number of slipped ticks) or a trailing limit.</td>
</tr>
</tbody>
</table>
### Setting Trading Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOM ratio between best bid/ask</td>
<td>Used with <strong>Monitor leaning DOM volume</strong>. DOM-Triggered Best Bid/Ask Ratio uses the <strong>Threshold</strong> parameter as a volume ratio (allowed values 0.1 – 999.9). When the ratio between volumes available at the exchange (best bid/ask for a leaning sell order, best ask/bid for a leaning buy order) falls below the specified ratio, then the system performs a payup (replaces the original limit order to complete the spread with a limit order that has the price adjusted based on specified number of slipped ticks) or a trailing limit.</td>
</tr>
</tbody>
</table>

An incomplete order results when:

- the price of the second leg cannot be met
- the first leg was filled at an undesirable price forcing execution of the second leg

Your incomplete order strategy depends on the market you’re trading. If you anticipate a:

- high volatility, non-directional market, then a trailing limit order may be best because you are more likely to fill at your desired price than with a payup.
- high volatility, directional market, then a payup may be most effective.
- low volatility market, then you may choose not to set up an incomplete strategy because you have a good chance to execute at your desired price.

**Queue holders** might also interest traders looking to manage trades in less volatile markets.
Setting Trading Preferences

While trading parameters apply to a particular strategy, trading preferences apply to spread trading in general.

In addition to the preferences explained in this section, you can set specific Risk and Limits & Stops preferences for a particular QFormula (click the Add Symbol button).

To change preferences, click the Setup button, then click Trading Preferences.
Trading Preferences: Display

Use native strategy quotes to calculate OTE

Choose whether to calculate OTE for native strategies using leg quote data or strategy quote data (if available from the exchange). For example, CLEN3 and CLEQ3 (leg) or CLES1N3 (strategy). Select the Use native strategy checkbox, or leave it unselected to use leg quote data.

This preferences is selected and disabled if Group spread positions by filled spread orders is selected.

This setting is applied to all trading applications, including DOMTrader, Order Ticket, and Orders and Positions.

Group spread positions by filled spread orders

This preference is used to select the spread position calculation modes: by execution or by exchange trades.

On = calculate native and synthetic spread positions by execution of the strategy (based on trade data)

Off = calculate native and synthetic spread positions by outright leg positions (based on clearing data)

When this option is selected, the Use native strategy quotes to calculate OTE check box is selected and disabled, and the Show combined net position for relative commodities check box is cleared and disabled.

The by execution preference also governs Quote SpreadSheet; Enhanced Quote SpreadSheet; Portfolio Monitor; and Open Trade Equity, Position, and Profit & Loss trading studies. Additionally, the Order Display trading study shows fills of spreads and the Spread Matrix and Spread Pyramid display positions for strategies as well as for their legs.
Setting Strategy Orders Preferences

These settings apply to strategies on all trading applications.

Strategy order cancellation

One step in managing incomplete orders is to set cancellation behavior.

The first cancellation option, **Cancel strategy and incomplete legs**, tells the system to cancel the strategy and the incomplete legs when you cancel the order.

Suppose you’re working a 10 x 10. You’re filled 2 and then 6 on one leg. You miss 6 on the other leg, so that leg is now incomplete 6. This option says: I want to cancel the strategy, but leave the 6 I need in the marketplace, so I have a chance of being filled.

The second option, **Cancel strategy and continue working incomplete legs**, tells the system to cancel the strategy but not the incomplete legs when you cancel the order. In this case, you cancel everything in order to manage the risk.

Instead of cancelling the order, you may choose to modify it. Imagine one leg of your strategy is filled, and the market moves away before the second leg can be filled. Drag and drop the second leg to modify it, so that it has a better chance of being filled.
**Leg order cancellation for a strategy**

These preferences determine how the system handles a leg cancellation.

The first option, **Cancel the incomplete leg and the strategy**, tells the system to cancel both the incomplete leg and the strategy when you cancel the leg order.

The second option, **Cancel the leg order and continue working the strategy**, tells the system to cancel the incomplete leg but not the strategy when you cancel the leg order.
Enabling Iceberg Orders

In order to trade spreads using iceberg orders, you have to enable iceberg strategy orders. This enablement is set in trading preferences on the Smart Orders window.

- You can set preferences that are specific for a particular QFormula by clicking the Add symbol button.
- Select the Enable Iceberg Limits for strategy orders check box to trade using icebergs.
- You can choose one of four options for the visible quantity.
  
Enter visible order size:
  - show a set percentage of the total order (1-100)
  - show a set number of contracts (1-9999)

Random order sizes:
  - show random sizes between some percent of the order
  - show random sizes between some number of contracts
Default = Enter a visible order size of 1 lot.

- Select the **When in Iceberg Mode** check box if you want limit orders placed instead of icebergs for order sizes smaller than the one given. This parameter applies if the order size is changed on the DOMTrader (not on the confirmation window). Default = on.

- If the **Enable confirmations** check box is not selected, then you are not be able to change the visible order size on a case by case basis. Default = on.
Enabling OCOs

In order to trade spreads using OCOs, you have to enable OCO strategy orders. This enablement is set in trading preferences on the **Smart Orders** window.
Trading Spreads

Once you have the spread set up, you can place a spread order in the same ways non-spread orders are placed. To read more about general order placement, please refer to the Trading with CQG Integrated Client User Guide (www.cqg.com/Docs/Trading_UG.pdf).

You can place non-spread orders on the leg trading application. For example, you’re working CLE-ET. You have three Order Tickets open: CLE-ET, CLE, and ET. The CLE and ET Order Tickets display the legs for the spread order. You can place an order for CLE on the same Order Ticket, even though that order is not part of the spread. In this way, you can add stop orders to a leg for added protection. Use the spreads button to show and hide non-spread orders.
Placing Spread Orders on the Order Ticket

1. Enter the QNumber or spread formula on the Order Ticket. The background color changes.
2. Select the order quantity.
3. Select the order type: **DAY**. (See Entering OCOs and Entering Iceberg Orders for other order types.)
4. You have various options available to make changes before you place the order:
   a. To change the ratio of one leg to another, type a new value in the leg ratio field.
   b. If you would like to change which leg is currently working, click the working leg menu arrow and select the leg.
   c. If you would like to change the order type used for spread completion, click the complete spread menu arrow.
   d. If you would like to change trading parameters, click either the working leg menu or the complete spread menu arrow, and then click Setup parameters.
5. Move along the DOM ladder until you’re at the desired price.
6. Click the buy or sell button to place the order.
7. If you have confirmations enabled, a confirmation message is displayed. Change or confirm the parameters, and click **Place Order**.

Your order is displayed on the DOM ladder while it’s working. Once it’s filled or cancelled, it’s displayed on the Orders and Positions pane on the Order Ticket and on the Orders and Positions window.
Placing Spread Orders on the Order Desk

1. Enter the QNumber or spread formula in the symbol field. The background color changes.
2. Select the order quantity.
3. Select LMT, Stop, or Market.
4. Select the order type: DAY. (See Entering OCOs and Entering Iceberg Orders for other order types.) You have various options available to make changes before you place the order:
   a. To change the ratio of one leg to another, type a new value in the leg ratio field.
   b. If you would like to change which leg is currently working, click the working leg menu arrow and select the leg.
   c. If you would like to change the order type used for spread completion, click the complete spread menu arrow.
   d. If you would like to change trading parameters, click either the working leg menu or the complete spread menu arrow, and then click Setup parameters.
5. Use the up and down arrows to move to the desired price.
6. Click the buy or sell button to place the order. A notification is displayed at the bottom of the window.

Monitor the order state on the Orders and Positions window.
Trading Spreads

Placing Spread Orders on the Quote SpreadSheet (QSS)

In addition to standard trading features on the QSS, it includes an **INCPLT** (incomplete) field for spread trading. If you would like to see synthetic spread positions in the **Pos** field, make sure that option is selected in Quote SpreadSheet Trading Preferences.

1. Enter the QNumber or spread formula in the **Symbol** field.
2. Right-click the QSS.
3. Click **Customize Columns**.
4. Using the available fields menu, select **Orders and Positions**.
5. Add the trading fields.
6. Click **OK**.
7. Click either the **MKT** buttons or the **Bid** and **Ask** price buttons to place an order.
Placing Spread Orders on the DOMTrader

1. Enter the QNumber or spread formula on the DOMTrader. The background color changes.
2. Select the order quantity.
3. Select the order type: **DAY**. (See Entering OCOs and Entering Iceberg Orders for other order types.)
4. You have various options available to make changes before you place the order:
   a. To change the ratio of one leg to another, type a new value in the leg ratio field.
   b. If you would like to change which leg is currently working, click the working leg menu arrow and select the leg.
   c. If you would like to change the order type used for spread completion, click the complete spread menu arrow.
   d. If you would like to change trading parameters, click either the working leg menu or the complete spread menu arrow, and then click Setup parameters.
5. Click the buy or sell column at the desired price to place the order.
6. If you have confirmations enabled, a confirmation message is displayed. Click **Place Order**.

Your order is displayed on the DOM ladder while it’s working. Monitor the order on the Orders and Positions window.
Entering OCOs

1. Click the special orders button.

2. Place the orders (in this example, one limit order and one stop order).

3. Click the special orders button.

4. Confirm both orders.

5. If one order is filled, the other is cancelled. Notice the status in the fill report:

<table>
<thead>
<tr>
<th>#</th>
<th>Stat</th>
<th>S</th>
<th>OC</th>
<th>Size</th>
<th>B/S</th>
<th>Symbol</th>
<th>T</th>
<th>Durati</th>
<th>Avg Fill Price</th>
<th>Place Time</th>
<th>Order #</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>☒</td>
<td>☒</td>
<td>☒</td>
<td>1</td>
<td>Buy</td>
<td>UA_EP_ENQ</td>
<td></td>
<td></td>
<td></td>
<td>15:23:26</td>
<td>OCO 688975057</td>
<td>Cancelled</td>
</tr>
<tr>
<td>8</td>
<td>☒</td>
<td>☒</td>
<td>☒</td>
<td>1</td>
<td>Buy</td>
<td>UA_EP_ENQ</td>
<td></td>
<td></td>
<td></td>
<td>16180</td>
<td>OCO 68897506</td>
<td>Filled</td>
</tr>
</tbody>
</table>
**Entering Iceberg Orders**

In this procedure, DOMTrader is being used. You can use any trading application.

1. Enter the QNumber or spread formula on the DOMTrader. The background color changes.
2. Select the order quantity.
3. Select the order type: **ICBG strategy** (both legs are iceberg orders) or **ICBG leg**.
4. You have various options available to make changes before you place the order:
   a. To change the ratio of one leg to another, type a new value in the leg ratio field.
   b. If you would like to change which leg is currently working, click the working leg menu arrow and select the leg.
   c. If you would like to change the order type used for spread completion, click the complete spread menu arrow.
   d. If you would like to change trading parameters, click either the working leg menu or the complete spread menu arrow, and then click Setup parameters.
5. Move along the DOM ladder until you’re at the desired price.
6. Click the buy or sell column to place the order.
7. If you have confirmations enabled, a confirmation message is displayed. Change or confirm the parameters, and click **Place Order**.

Your order is displayed on the DOM ladder while it’s working. Monitor the order on the Orders and Positions window.
Viewing Spread Orders

Once you place your order, it’s displayed on the DOM ladder and on the Orders and Positions window.

Hover your mouse over the spread order icon (S for spread and L for spread leg) to see order information.

Click the spreads button to show and hide non-spread orders for each leg.
Viewing a Fill Report

Once the order is filled, you receive a fill report (depending on preferences). Fills are color-coded according to the color of each spread. So, after several orders have been filled, the fill report looks something like this:

You can open a fill report by clicking the Fill Report button on the trading application toolbar. You can also click the More button on the CQG IC toolbar and then click Fill Report.

This image shows how fractional trade ratios are displayed on the Fill Report:
In this example, `SPREAD(1.6*FVAU2-USAU2, , ,1.6:1)` is filled 16:10.
Sniper Mode

Sniper mode is used when you want to trade a spread strategy and show no orders in the legs.

The benefits of using Sniper mode include:

- Dramatic reduction of messaging to the exchange. This achieved by not having to modify any working leg orders.
- Optimal probability of order execution. This may reduce the probability of a incomplete order.
- Ability for the trader to prevent order size from being published to the public book.
- Works in conjunction with Iceberg orders.

When an order is placed using Sniper mode, the spreader core of servers holds a trader’s strategy logic at the server level, acquiring market data from each leg of the strategy.

When the spread strategy can be executed on each leg to complete the strategy at the trader's limit price, CQG Spreader injects the leg orders into the public book to complete the strategy.

To use Sniper mode

1. Enter the QNumber or spread formula.
2. Clear all working legs (so that no legs have a check mark in front of them).

3. When none of the legs are working, the sniper is displayed:
4. Notice that no leg orders are displayed:

5. When the order is filled, the order is marked with a Sniper icon in the fill report:
Managing Spreads

Spread orders are managed in the same ways non-spread orders are managed. They can be modified or cancelled using any trading application. To read more about general order management, please refer to the Trading with CQG Integrated Client User Guide (www.cqg.com/Docs/Trading_UG.pdf).

Management of spread orders goes beyond modifying and cancelling though, as spread strategies introduce the possibility of incomplete orders. CQG provides ways for you to manage those incomplete orders before they happen through parameters.

If an incomplete order should occur, you can manage it from the Incomplete window on the Strategy Manager and from the Quote SpreadSheet.

Traders should also be aware of potential overfills. Being aggressive and working multiple legs may be beneficial, but there is a higher chance of being overfilled if the market is swept.
Using the Strategy Manager

CQG has incorporated a Strategy Manager into the Orders and Positions window. Click the Strategy Manager tab to display your spread orders.

The Strategy Manager has standard tabs for working, filled, cancelled, excepted, and all orders and a tab for incomplete orders. The Incomplete tab blinks when an order has been added to that window. Also, if you have the Orders and Positions window open, focus moves to that window when an incomplete order is added. You can set Notifications preferences, so that a sound is made when an order becomes incomplete.

If you have set up incomplete order parameters, the system will work the order for you according to those parameters. Otherwise, you can work the incomplete order yourself.

You can add both net change and yield data to the Orders and Positions window too.

Click the arrow buttons on the left to expand and collapse the spread orders to show and hide the spread legs. The icons indicating spread (S) and leg (L) are color-coded according to the spread color.
Hover your mouse over an icon to see a tooltip with order details:

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Status</th>
<th>Order ID</th>
<th>Ticket ID</th>
<th>Symbol</th>
<th>Price</th>
<th>Size</th>
<th>Order Type</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/22/12</td>
<td>25:00</td>
<td>Working</td>
<td>GW758_42</td>
<td>23751660.7</td>
<td>5YR</td>
<td>14.847</td>
<td>5</td>
<td>Sell</td>
<td>SPREAD(2.5‘FVA-US9.5Z2)</td>
</tr>
<tr>
<td>11/22/12</td>
<td>25:00</td>
<td>Working</td>
<td>GW758_42</td>
<td>23751660.7</td>
<td>5YR</td>
<td>14.847</td>
<td>5</td>
<td>Buy</td>
<td>SPREAD(0.5‘FVA-US9.5Z2)</td>
</tr>
</tbody>
</table>

Transaction History:
- 11/22/12 25:00:07 - In Ticker
- 11/22/12 25:00:76 - Working
- 11/22/12 30:15:430 - Working - FVAZ1
- 11/22/12 30:27:703 - Cancelled - FVAZ1
- 11/22/12 30:27:703 - Modified size (5 to 25) - FVAZ1
- 11/22/12 31:14:94 - Modified size (25 to 35) - LMT price (12000 to 12027) - FVAZ1
- 11/22/12 31:14:659 - Working - FVAZ1
- 11/22/12 31:14:659 - Working - FVAZ1
- 11/22/12 31:16:133 - Fill 3 @ 12027 - FVAZ1
- 11/22/12 31:16:310 - Fill 1 @ 143250 - USA21
- 11/22/12 31:18:356 - Fill 6 @ 12027 - FVAZ1
- 11/22/12 31:18:356 - Fill 10 @ 12027 - FVAZ1
- 11/22/12 31:18:733 - Fill 1 @ 12027 - FVAZ1
- 11/22/12 31:18:356 - Fill 5 @ 12027 - FVAZ1
- 11/22/12 31:19:123 - Fill 2 @ 143250 - USA21
- 11/22/12 31:19:356 - Fill 1 @ 163289
- 11/22/12 31:19:440 - Fill 4 @ 143250 - USA21
- 11/22/12 31:19:550 - Fill 2 @ 163289
- 11/22/12 31:19:733 - Fill 1 @ 143250 - USA21
- 11/22/12 31:19:573 - Fill 1 @ 163289
- 11/22/12 31:20:020 - Fill 2 @ 143250 - USA21
- 11/22/12 31:20:330 - Fill 1 @ 163289

Order fill:
- 5 @ 163289

Aggregate leg fill:
- FUS, FVAZ11: 25 @ 12027
- FUS, USA211: +10 @ 143250
Using the QSS

Even if you are not trading directly from it, the QSS is a helpful tool for managing incomplete orders. Link the QSS to the trading application, making sure the QSS is the parent window. If an incomplete order occurs, click the INCPLT field on the QSS to go directly to the application for the leg that’s incomplete.