



# DYNAMIC ORDER HUB

## User Guide

April 2024

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## Document Change History

Date	Description
09/13/2022	Initial document preparation. Version 1.00. A Crichton.
30/04/2024	Add Diming and Reverse Hedge algos. Version 1.20. A Crichton.

## Introduction

The goal of this document is to serve as a manual and walk the user through the features of Exegy's new Metro App 'Dynamic Order Hub'. This document should serve as a guide for training any new user.

The purpose of the Dynamic Order Hub is to submit option limit orders and apply a choice of four algos to work the order. These are:

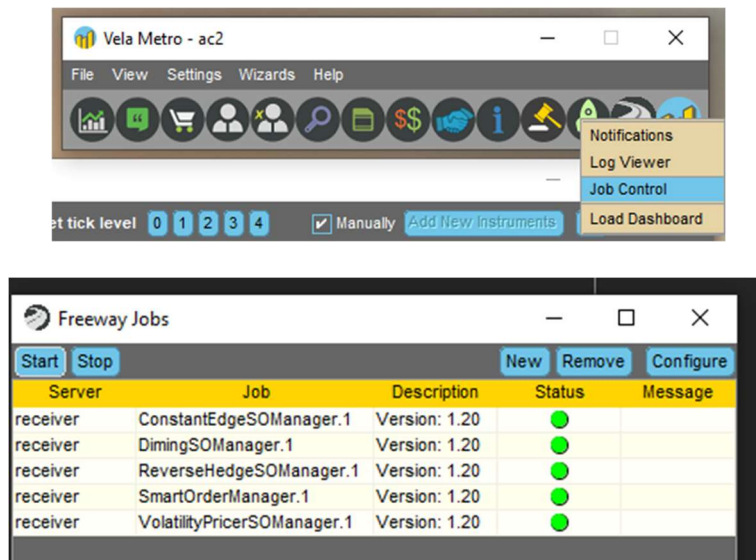
- (a) 'Constant Edge' – The user defines a quantity and bid or sell edge. An order is submitted and as the market moves the order price will adjust accordingly to maintain a constant market taking edge.
- (b) 'Volatility Order' – The user selects a target volatility. A submitted order will automatically adjust its price so that the implied volatility of the order is as close to the target value as possible. The implied volatility is defined in Metro model settings via Metro Now Trade Sheet.
- (c) 'Diming' – The user defines a bid or ask edge threshold and upon submit a limit order will 'dime the book' ie. automatically move to the top of book as the book changes. This process will continue as long as the calculated edge does not fall below the defined edge threshold. There are two modes for diming: passive and aggressive. Passive means the user's order can be joined at the top-of-book with other orders and aggressive means the user's order will always try to be top-of-book by itself.
- (d) 'Reverse Hedge' – The user defines the **option's underlying** limit price, quantity, option order time in force (can be Immediate-or-Cancel or based on a timer) and the **option limit price**. The underlying quantity order will be submitted first and as fills or partial fills get executed then the 'reverse hedge' on the option is submitted to zero the delta. If the options are not filled, either IOC or in the timed interval, then a **limit** order to reverse the underlying filled position is submitted.

The main GUI is an intuitive 'order ticket' similar to the existing Metro order ticket that allows quick access to order statuses with mass or specific order cancellation functionality.

## Configuration and Setup

Please reach out to Exegy Metro support for installation. There are a few server processes required for the correct functionality of the Dynamic Order Hub: The main order routing job (SmartOrderManager) and supporting algo jobs (ConstantEdgeSOManager, VolatilityPricerSOManager, DimingSOManager, ReverseHedgeSOManager).

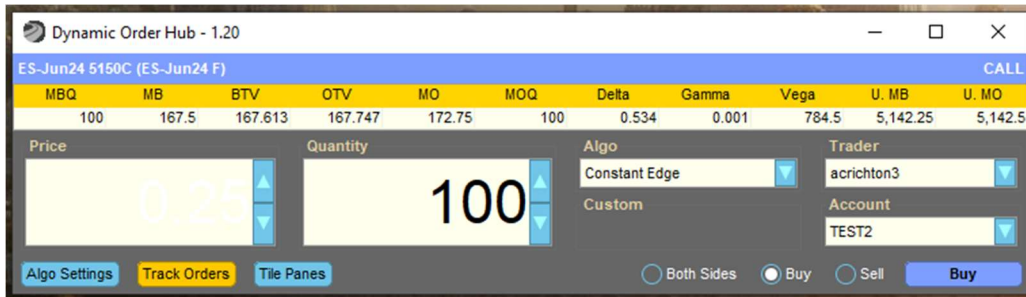
There are two algo specific configurations available to change. These can be adjusted via Metro Now > Right Click Freeway icon > Job Control > Select job and select 'Configure'.



**Fig. 1a and 1b: Dynamic Order Hub backend jobs running seen in onRamp**

- DimingSOManager – User can select Passive or Aggressive diming mode. Please note job must be stopped and started before the configuration can take place.
- ReverseHedgeSOManager – The user can select the expiration time of the options order sent during a reverse hedging algo. Default is 5000ms.

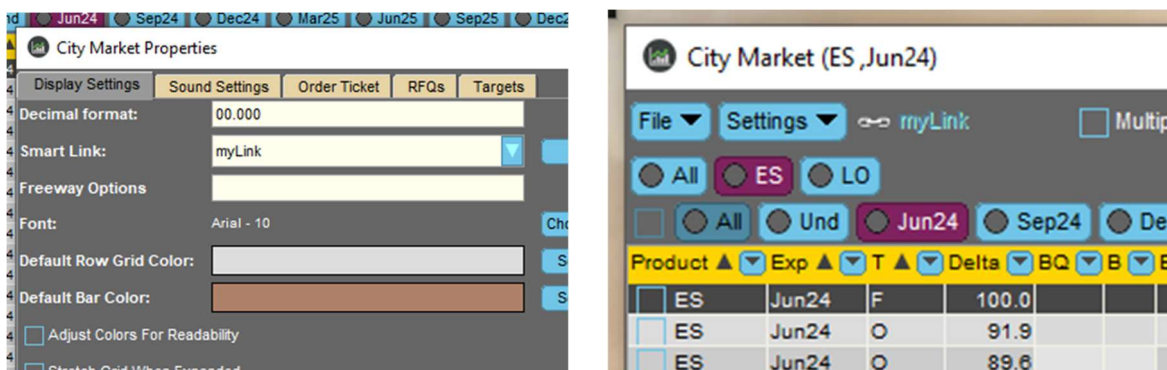
The Dynamic Order Hub itself can be accessed by clicking the Freeway Icon on the Metro NOW widget selection panel and selecting Dynamic Order Hub:



**Fig. 3: Dynamic Order Hub**

## Instrument selection and widget linking

Instrument selection is done via Metro native widgets, e.g., City Market. In order to send the instrument selected to the Dynamic Order Hub you must first 'link' the widget to Freeway. This is easily done via the native Widget Settings menu > Display Settings > Smart Link. Simply leave this non-empty, e.g., 'myLink' is below:

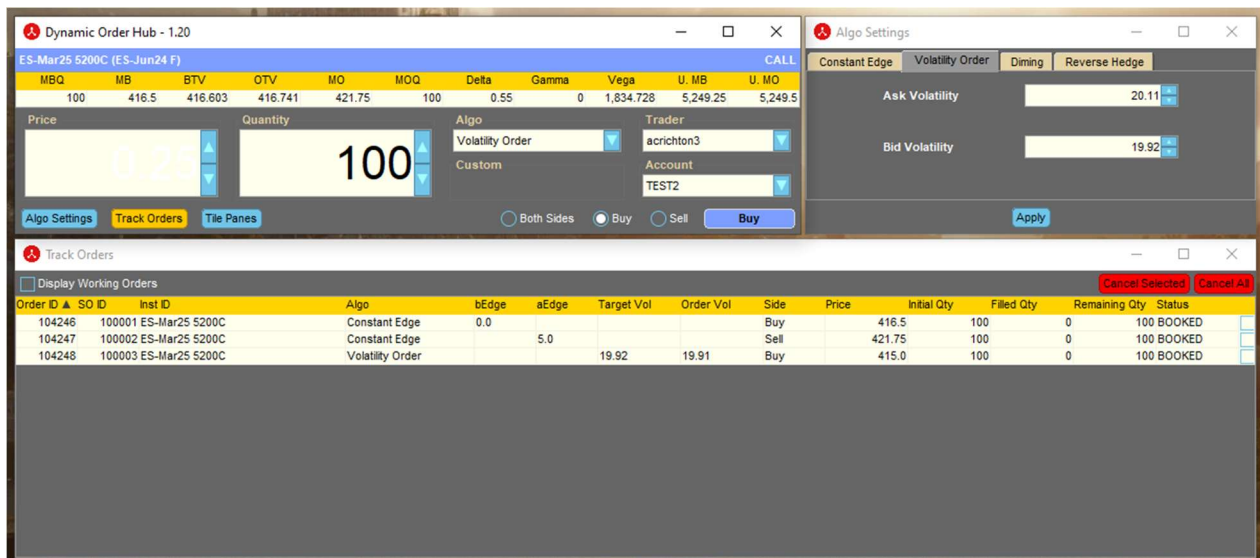


**Fig. 4a and 4b: Native Widget instrument selection**

## GUI Definitions

The Hub consists of three panels:

- The main order ticket window
- Order Tracking window – Activated by the ‘Track Orders’ button. If there are any open orders in the system, the button will turn yellow.
- Algo Settings window – The settings for the particular algo you are interested in running can be selected from the appropriate tab. Selecting the tab automatically changes algo type. *N.B.* If the limit price is defined by the algo, the price field is clear to remove any confusion of order entry price. This is true if the Quantity field is redundant ie. in the use of ‘REVERSE HEDGE’ also the option quantity is determined by the underlying quantity (and the option delta).



**Fig. 5: Dynamic Order Hub with all panels in display**

Pressing ‘Algo Settings’ or ‘Track Orders’ button opens and closes the relevant panel with ‘Tile Panes’ arranging the panels neatly as above.

The Dynamic Order Hub’s main window consists of indicative market prices and theos for reference. The greeks are simply the average of bid and ask greeks. The other GUI components as seen in Fig. 5 are detailed below:

Label	Description
Price	Limit price of order. Will be blank if algo defines price. (Constant Edge, Volatility Order and Diming).
Quantity	Quantity of limit order. (Will be blank for Reverse Hedge algo type).
Algo	Select algo of choice.
Trader	Named Trader in the system can be selected here.
Account	Trading account can be selected here.
Order Side	BUY – A single BUY order is submitted to market, SELL – A single SELL order is submitted to market, BOTH SIDE – Two independent BUY and SELL orders are submitted to market.
Submit Orders	The Order request will be sent to the back-end jobs with the appropriate algo settings and quantity and side(s). The jobs will then submit with the appropriate limit price(s) and update dynamically. Order status can be seen in the ‘Track Orders’ panel.

Double clicking the option type (CALL or PUT) will change the option type from call to put and vice-versa. Moving the main order ticket and selecting ‘Tile Panes’ will neatly stack the panels around the option ticket.

### Track Orders window

All orders submitted via the Hub are tracked here with algo-specific parameters detailed as well. The checkbox column on the very righthand side allows for selective order cancelling with ‘Cancel Selected’ or all open orders can be cancelled with ‘Cancel All’. If there are any open orders in the system (sent by this app) then the cancel buttons will turn red (otherwise green). ‘Display Open Orders’ will display orders yet to be completed.

The OrderID column is the Metro internal Order ID and this can also be seen in the native widget Order Viewer. The SO ID is an ID relevant to this application only.

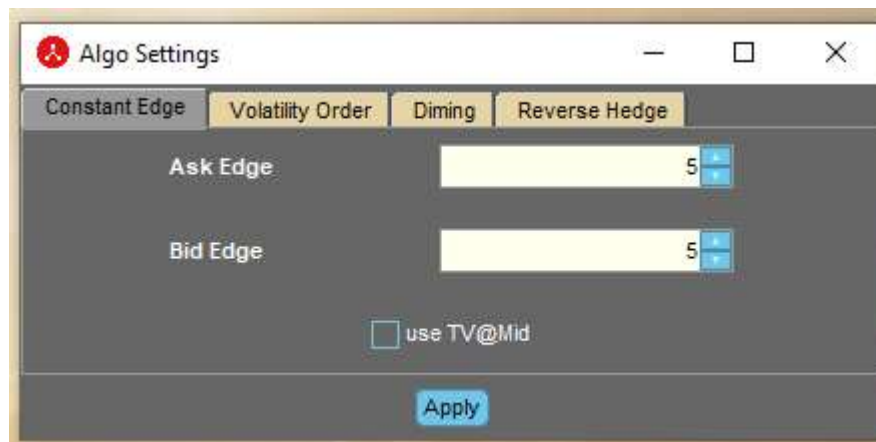
bEdge and aEdge are the parameters as set in the Algo Settings panel. Order Vol is the implied vol of the order in the market and can be compared to the target volatility for reference.

**NOTE:** All orders submitted by the DOH are also viewable in the Metro Order Viewer and can be modified/cancelled there like any other order.

## Algo Settings window

The Algo settings window allows you to define the algo-specific parameters that you want to apply to the submitted orders. Current algo selection can be done by selecting the appropriate panel.

### Constant Edge Parameters



**Fig. 6a: Algo Settings – Constant Edge settings**

The Constant Edge algo submits a BUY or SELL or BOTH order(s) to market with:

- BUY order limit price =  $bTV - bEdge$  (rounded down to nearest tick)
- SELL order limit price =  $aTV + aEdge$  (rounded up to nearest tick)

$bTV$  and  $aTV$  are the bid and ask theo values respectively.  $bEdge$  (bid edge) and  $aEdge$  (ask edge) are set in the above panel. As the theo changes on the option the price will be adjusted to keep a constant edge defined above.

Use  $TV@mid$  uses the mid-theo (ie the theo value calculated at the underlying mid) for both the buy and sell orders instead of the bid (for BUY) and offer (for SELL) orders. This can be useful when there is a wide bid/ask spread in the future and you are not concerned with hedging on the attributable side (for example, buy call, sell future on bid).

Double clicking MBQ and MOQ will populate the option quantity



## Volatility Order Parameters



**Fig. 6b: Algo Settings – Volatility Order settings**

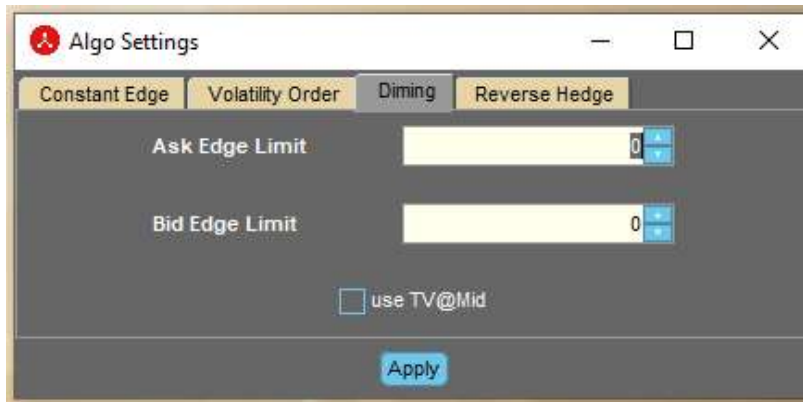
The Volatility Order allows the user to set the implied volatility of the order. As the theoretical value of the option changes, the order limit price will change to get as close to that target volatility as possible. The order implied vol is given as reference in the Order Tracking window. N.B. BUY orders are rounded down to nearest tick and vice versa for SELL orders.

It is important to note that any implied volatility values calculated use the vol curve model established by the user in the model settings. If a target vol cannot be found or leads to ambiguous results, the order will not be submitted. This can be verified in the Order Tracking window.

Bid volatility applied to buy order and Ask volatility applied to sell orders.

Double clicking MBQ and MOQ will populate the option quantity.

## Diming Parameters



**Fig. 6c: Algo Settings – Diming settings**

The Diming algo allows the user to submit an order at specific quantity and also configure the minimum allowed edge limit for that order. As the book is updated with other orders the algo will work to move your order to the top of the book. This occurs for every book update. If the price of the next most aggressive level is below the defined edge threshold, then the algo will automatically cancel the order. Double clicking MBQ and MOQ will populate the option quantity.

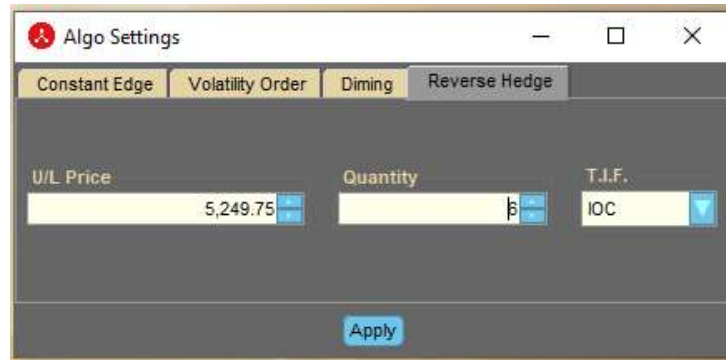
Even if the book remains static and the theoretical value of the option changes the algo will also check that there is no edge violation. It is important to note that:

- (a) You cannot submit two orders on the same for diming.
- (b) If an order is submitted to an empty book side then the entry price will be:

$$\text{Entry Price} = \text{Theo. Value} \pm (2 * \text{edgeLimit}) \text{ for (buy/sell)}$$

**NOTE: If Bid/Ask Edge Limit is set to 0 and there is no market to dime, an order will be submitted at your BTV/OTV or TV (if use TV@Mid is checked).**

## Reverse Hedge Parameters



**Fig. 6d: Algo Settings – Reverse Hedge settings**

The underlying associated with the option can be found at the top right of the order ticket. This panel is used to set the underlying entry price and quantity that will be reverse hedged against on the selected option. To get the U/L Price to populate, simply double click on the underlying price found in the order ticket and modify as needed. The option quantity will be determined by (underlying quantity / (bid/sell) delta).

**NOTE:** Quantity will ALWAYS be a positive number. The Buy/Sell aspect of the future trade will be determined by what you are defining in the OPTION order ticket.

The option order submitted per underlying fill will have a time-in-force (TIF) of immediate-or-cancel (IOC) or expire after a pre-determined time (TIMER). The timer (in milliseconds) can be configured from the ReverseHedgeSOManager job configuration.

Double clicking the price field MB, MO, BTV or OTV will populate the option limit price and double clicking U. MB. And U.MO will populate the underlying price in the 'Reverse Hedge' tab.

### Handling order cancellations in during Reverse Hedge process

It is possible for an underlying to have multiple associated option orders if the underlying goes through stages of being partially filled in a piecewise manner. If any of those orders are cancelled or expired during the reverse hedge, then:

- The algo will submit an order to reverse (back) trade on any filled underlying orders if NO options are filled or partially filled.
- The algo will NOT submit an order to reverse (back) trade on any filled underlying orders if ANY options are filled or partially filled.

Please monitor the Metro Now 'Order Viewer' to get overall status of orders within the system. Orders can be cancelled via. order viewer too and the Dynamic Order Hub will apply the same logic to that cancel as I does to orders cancelled with in the Hub.

**NOTE: Please ensure Self-Match-Prevention is set up with your exchange and set to: CANCEL OLDEST. This will ensure that in a scenario where an option order does not get filled and you submit a cancelling future order, if you still have a future order working on the other side that is top of book, it will be cancelled and your newest order to cancel out the trade will be submitted successfully without trading with yourself.**

## General Order Cancellation

If there are any working orders then the 'Track Orders' button will turn yellow and the cancel buttons within the Track Orders window will turn red. It is possible to select, using the far-right checkbox, to cancel individual orders, using 'Cancel Selected'. The 'Cancel All' button will cancel all orders.

Clicking the 'Display Working Orders' checkbox will allow you to quickly see what orders have been submitted and are currently being worked. The states of individual orders can also be checked in **Metro Order Viewer**.

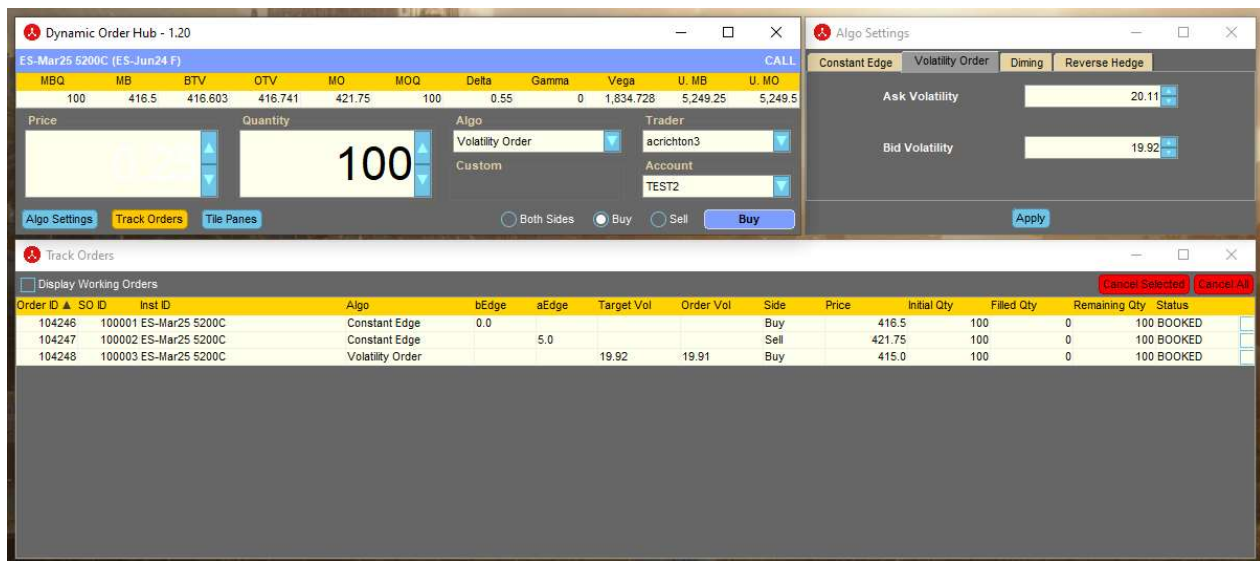


Fig. 7: Dynamic Order Hub with active orders.

## Working Order Limit Number

The Dynamic Order Hub has an open order limit of 10 (Please note that all the associated orders for a 'Reverse Hedge' count as one as it is part of a single trading strategy). It is not possible to have more than 10 open orders and a prompt will be given.