VELA™

ADVANCED ORDER APP

User Guide

April 2017

Table of Contents

Purpose

The goal of this document is to walk the user through typical uses of the app. This document should serve as a guide for training any new user.

Project Summary

The Advanced Order App was designed to provide traders with a way to place orders using logic that isn't exchange supported. The Advanced Order App currently supports the following use cases (for all instruments):

1. Orders with a last trade trigger that are either Greater Than, Greater Than or Equal To, Less Than, or Less Than or Equal To the last traded price.
    a. These orders can be Limit or Market orders.
2. Orders with a mid-market trigger that are either Greater Than, Greater Than or Equal To, Less Than, or Less Than or Equal To the current mid-market price.
    a. These orders can be Limit or Market orders.
3. Orders triggered via 1 that have a Stop Loss order that is placed at X ticks behind the executed price of the original order triggered by 1 (ticks are determined by minPriceIncrement in Metro NOW).
4. The use-cases in combination with TWAP execution.
5. The use-cases in combination with the OrderExtractor execution.

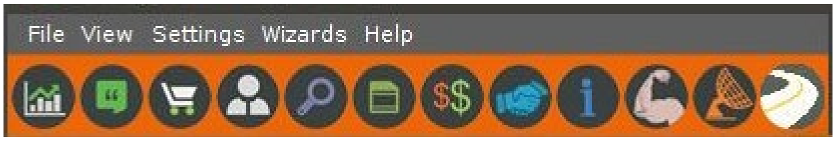
The Advanced Order App is built in such a way that additional Triggers or possible contingent orders can be added to the application.

Deliverables

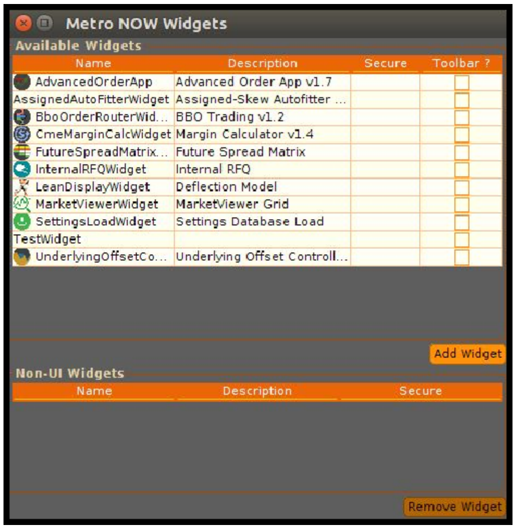
Name	Description
Advanced Order App	This is the front-end interface for the user.
AdvancedOrderAppBackend	This is the algorithm that is running in the background. Messages are sent to this algorithm from the “Advanced Order App, to update and place working orders.

Configuration and Setup

In order to use the Advanced Order App, the user must first purchase the app from the Metro App Store. Once purchased the user can affix the app to their Metro Toolbar by clicking on the Inventory manager:



Once in the inventory manager, find AdvancedOrderApp in the list, and check the toolbar checkbox:



Metro NOW Widgets

Available Widgets

Name	Description	Secure	Toolbar ?
AdvancedOrderApp	Advanced Order App v1.7		□
AssignedAutoFitterWidget	Assigned-Skew Autofitter ...		□
BboOrderRouterWid...	BBO Trading v1.2		□
CmeMarginCalcWidget	Margin Calculator v1.4		□
FutureSpreadMatrix...	Future Spread Matrix		□
InternalRFQWidget	Internal RFQ		□
LeanDisplayWidget	Deflection Model		□
MarketViewerWidget	MarketViewer Grid		□
SettingsLoadWidget	Settings Database Load		□
TestWidget			□
UnderlyingOffsetCo...	Underlying Offset Controll...		□

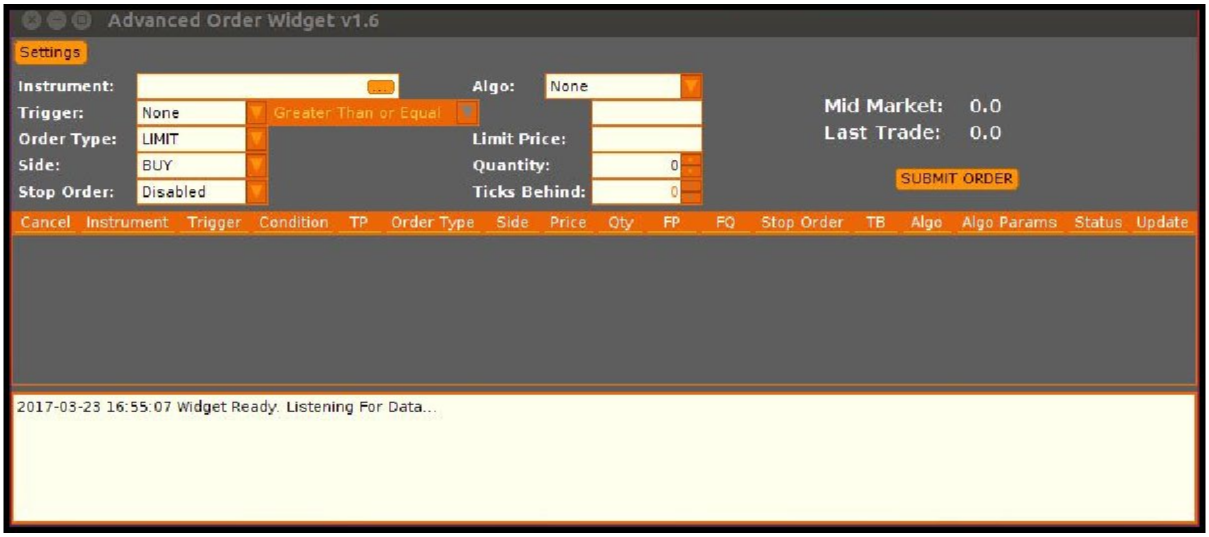
Non-UI Widgets

Name	Description	Secure

The new Icon will now appear in your Metro Toolbar. You can now click on this icon and launch the Advanced Order App.

NOTE: Users should launch only one instance of this app at a time. If multiple instances of Advanced Order App are launched, they will be disabled so orders cannot be placed or updated.

The Advanced Order App should look roughly like this



Instrument:
Trigger: None
Greater Than or Equal
Order Type: LIMIT
Side: BUY
Stop Order: Disabled
Algo: None
Limit Price:
Quantity: 0
Ticks Behind: 0
Mid Market: 0.0
Last Trade: 0.0

```
2017-03-23 16:55:07 Widget Ready. Listening For Data...
```

Questions regarding the installation and loading process can be sent to MetroSupport@tradevela.com

Advanced Order App GUI Definitions

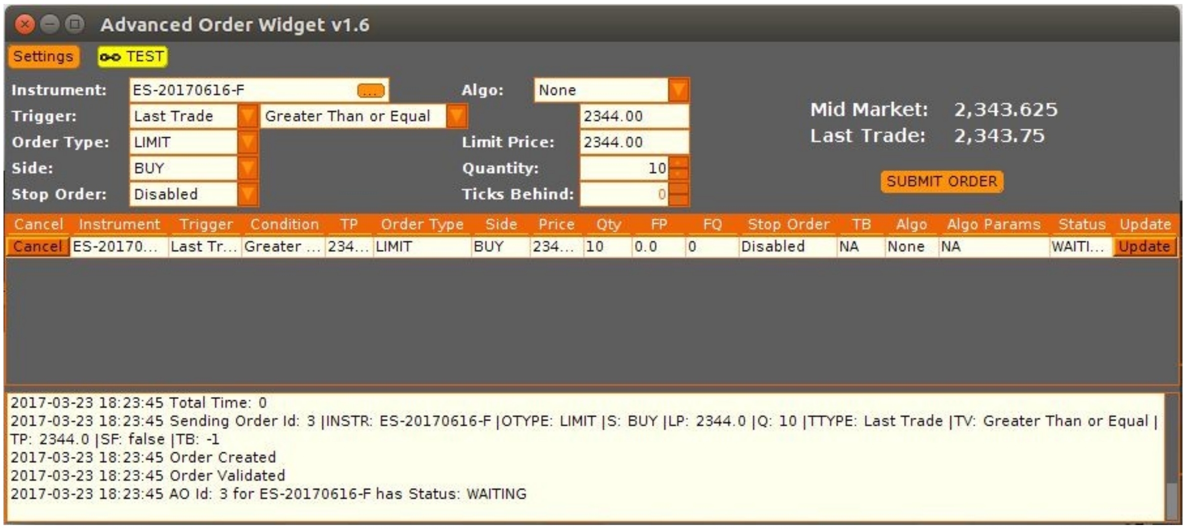
Function	Description
Product	This is the product that the order will be placed for.
Trigger	This defines what event triggers a check if the order should be placed.
Trigger Variable	This defines the mathematical operator for the Trigger.
Trigger Price	This is the price used for the Trigger.
Order Type	This sets the Order Type (either Limit or Market Order).
Limit Price	This sets the price used for limit orders.
Side	This defines if the original order is a BUY or SELL.
Quantity	This sets the size of the original order.
Stop Order	This is either enabled or disabled and determines if a stop order will be placed behind the original order.
Ticks Behind	If Stop Order is enabled, then this defines where to place the stop loss order, in terms of ticks behind the filled original order.
Algo	Specifies an optional execution algo to handle the order.

Use Cases

Use Case 1 & 2- Placing an order that triggers based on Last Trade or Mid-Market

This is a simple order that can be triggered on a breakout move or if the market moves to a certain level and the user wants to place an order as a result.

1. The user starts by selecting the instrument to trade from the instrument picker. Once selected, a message will be sent to the backend job, which will begin reporting last trades and mid-markets to the app. The last trade price (if available) will appear in the "Last Trade" field in the upper-right part of the app. Likewise the mid-market price will appear in the "Mid-Market" field in the upper-right part of the app.
2. The user selects a Trigger from the dropdown (Last Trade is the only option currently available).
3. The user selects a Trigger qualifier from the following options
   a. Greater Than or Equal
   b. Greater Than
   c. Less Than
   d. Less Than or Equal
4. The user enters a Trigger price. Assuming selections of "Last Trade", "Greater Than or Equal" and "2344", then the app's backend job would check if Last Trade is Greater Than or Equal to 2344, then place the subsequent order.
5. The user selects an Order Type (current options are Market and Limit orders). If Limit is selected, then the user must enter a price in the Limit Price field.
6. The user chooses if the order to be placed is a BUY or SELL order when the order is placed. A quantity must also be set for the order when the order is placed.
7. Now that all the proper variables have been set, the user presses the Submit Order button. A new line item will be placed in the Order Viewer Table.



Instrument: ES-20170616-F
Trigger: Last Trade | Greater Than or Equal | 2344.00
Order Type: LIMIT
Side: BUY
Stop Order: Disabled
Algo: None
Limit Price: 2344.00
Quantity: 10
Ticks Behind: 0
Mid Market: 2,343.625
Last Trade: 2,343.75

Cancel	Instrument	Trigger	Condition	TP	Order Type	Side	Price	Qty	FP	FQ	Stop Order	TB	Algo	Algo Params	Status	Update
Cancel	ES-20170...	Last Tr...	Greater ...	234...	LIMIT	BUY	234...	10	0.0	0	Disabled	NA	None	NA	WAITI...	Update

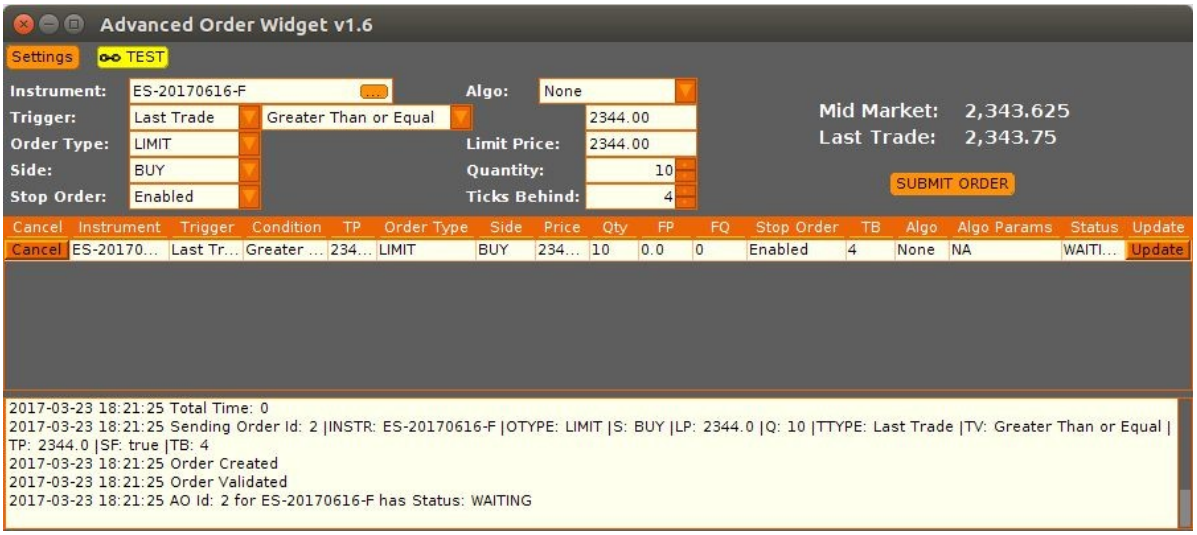
```
2017-03-23 18:23:45 Total Time: 0
2017-03-23 18:23:45 Sending Order Id: 3 |INSTR: ES-20170616-F |OTYPE: LIMIT |S: BUY |LP: 2344.0 |Q: 10 |TTYPE: Last Trade |TV: Greater Than or Equal |
TP: 2344.0 |SF: false |TB: -1
2017-03-23 18:23:45 Order Created
2017-03-23 18:23:45 Order Validated
2017-03-23 18:23:45 AO Id: 3 for ES-20170616-F has Status: WAITING
```

8. At this point the user may edit any of the fields (other than Instrument) from the Order Viewer Table within the app. To change the Instrument, the user must cancel the order and submit a new one, with the new instrument/product.
   a. Once a field has been edited, the user must press the Update button to send the changes to the backend job.
   b. The order can be cancelled by pressing the Cancel button.
9. Once the original order has been triggered and completed the order will be removed from the Order Viewer Table. Any updates to the placed order can be done from the Order Viewer within Metro.

Use Case 3 - Placing an order that triggers based on Last Trade with a Stop Loss

This is very similar to the use case above, however a Stop Loss order will be placed when any portion of the original order is filled.

1. This use case is starting from Use Case 1.7 as the workflow is the same to this point.
2. In order to place a stop order based on the execution of the original order the user selects Enabled in the Stop Order drop down box.
3. The user must set a Ticks Behind amount in the form of an integer greater than 0. This number will be multiplied by the product's minTick increment.
4. Now that all the proper variables have been set the user presses the Submit Order button, and a new line item will be placed in the Order Viewer Table.



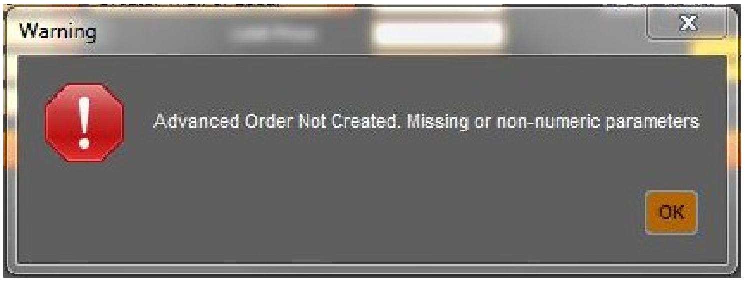
Instrument: ES-20170616-F
Trigger: Last Trade | Greater Than or Equal | 2344.00
Order Type: LIMIT
Side: BUY
Stop Order: Enabled
Algo: None
Limit Price: 2344.00
Quantity: 10
Ticks Behind: 4
Mid Market: 2,343.625
Last Trade: 2,343.75

Cancel	Instrument	Trigger	Condition	TP	Order Type	Side	Price	Qty	FP	FQ	Stop Order	TB	Algo	Algo Params	Status	Update
Cancel	ES-20170...	Last Tr...	Greater ...	234...	LIMIT	BUY	234...	10	0.0	0	Enabled	4	None	NA	WAITI...	Update

```
2017-03-23 18:21:25 Total Time: 0
2017-03-23 18:21:25 Sending Order Id: 2 |INSTR: ES-20170616-F |OTYPE: LIMIT |S: BUY |LP: 2344.0 |Q: 10 |TTYPE: Last Trade |TV: Greater Than or Equal |
TP: 2344.0 |SF: true |TB: 4
2017-03-23 18:21:25 Order Created
2017-03-23 18:21:25 Order Validated
2017-03-23 18:21:25 AO Id: 2 for ES-20170616-F has Status: WAITING
```

5. Since this order has a stop loss order enabled, the order with appear in the table with Stop as *enabled* and a number in the TB (Ticks Behind) column.
6. Once the original order is either filled or partially executed, a Stop Loss order will be placed TB-number of ticks behind the filled trade price.

Note: If the user doesn't enter valid parameters or tries to submit an order with missing parameters, a warning message like the following will appear.



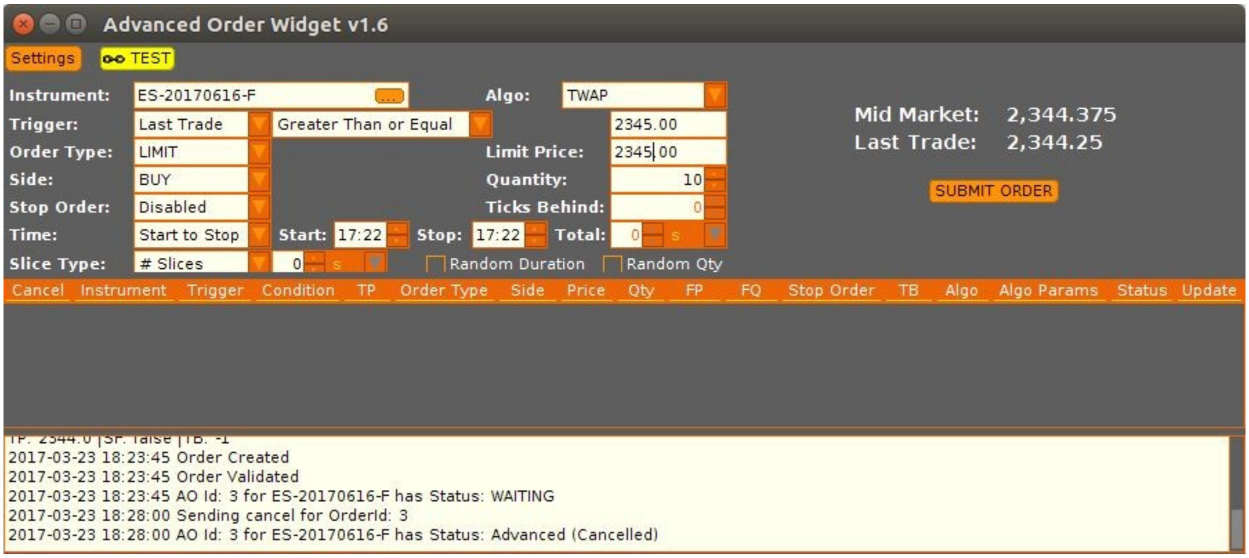
Warning

Advanced Order Not Created. Missing or non-numeric parameters

Use Case 4 - Placing an order that uses TWAP Execution

The TWAP Algo allows users to execute an order of significant quantity over time with several variable features. The workflow for setting up an advanced order with TWAP execution is like the above cases but has a few significant extra parameter specifications.

1. This use case is starting from Use Case 1.7 as the workflow is the same to this point.
2. The user selects 'TWAP' from the ***Algo*** drop-down box.
3. The user selects the time distribution style from the drop-down box. This includes the following options:
   a. ***Start to Stop***: Specify a start time and a stop time over which the order is placed. If this is selected, the user will need to fill the following two boxes labelled ***start*** and **stop**.
   b. ***Start + Total***: Specify a start time after which execution begins and total duration over which it ensues. If this is selected, the user will need to specify values in the boxes labelled ***start*** and ***Total***.
   c. ***Now + Total***: Specify a duration over which execution ensues beginning immediately. If this is selected, the user will need to specify a value for the box labelled ***Total***.
4. Select the appropriate slice type from the ***Slice Type*** dropdown. This includes the following options:
   a. ***# Slices***: Break the order up into the specified number of slices of equal quantity over the afore-specified time period. If this is selected, the user will need to specify several slices.
   b. Duration;
   c. Qty



Instrument: ES-20170616-F
Algo: TWAP
Trigger: Last Trade | Greater Than or Equal | 2345.00
Order Type: LIMIT
Limit Price: 2345.00
Side: BUY
Quantity: 10
Stop Order: Disabled
Ticks Behind: 0
Time: Start to Stop | Start: 17:22 | Stop: 17:22 | Total: 0 s
Slice Type: # Slices | 0 s | □ Random Duration | □ Random Qty

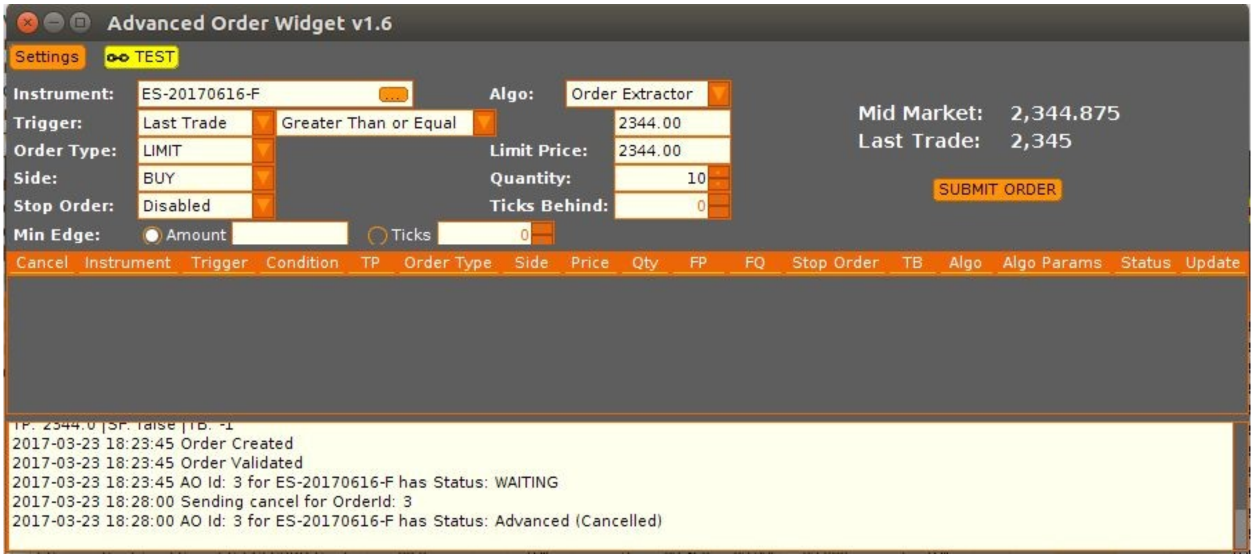
Mid Market: 2,344.375
Last Trade: 2,344.25

```
TP: 2344.0 |SF: false |TB: -1
2017-03-23 18:23:45 Order Created
2017-03-23 18:23:45 Order Validated
2017-03-23 18:23:45 AO Id: 3 for ES-20170616-F has Status: WAITING
2017-03-23 18:28:00 Sending cancel for OrderId: 3
2017-03-23 18:28:00 AO Id: 3 for ES-20170616-F has Status: Advanced (Cancelled)
```

Use Case 5 - Placing an order that uses OrderExtractor Execution

The OrderExtractor Algo allows users to specify a minimum edge requirement on orders, below which the order will be cancelled. The workflow for setting up an advanced order with OrderExtractor execution is like the above cases.

1. This use case is starting from Use Case 1.7 as the workflow is the same to this point.
2. The user selects ‘Order Extractor’ from the ***Algo*** drop-down box.
3. The user selects ***Amount*** or ***Ticks*** in the Min Edge section (bottom) of the Advanced Order App order info section and provides the desired edge in raw decimal, or number of ticks, respectively.
4. The user submits the order via the ***Submit*** button.



Instrument: ES-20170616-F

Trigger: Last Trade | Greater Than or Equal | 2344.00

Order Type: LIMIT

Side: BUY

Stop Order: Disabled

Min Edge: ● Amount ○ Ticks 0

Algo: Order Extractor

Limit Price: 2344.00

Quantity: 10

Ticks Behind: 0

Mid Market: 2,344.875

Last Trade: 2,345

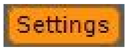
```
TP: 2344.0 |SF: false |TB: -1
2017-03-23 18:23:45 Order Created
2017-03-23 18:23:45 Order Validated
2017-03-23 18:23:45 AO Id: 3 for ES-20170616-F has Status: WAITING
2017-03-23 18:28:00 Sending cancel for OrderId: 3
2017-03-23 18:28:00 AO Id: 3 for ES-20170616-F has Status: Advanced (Cancelled)
```

Smart Linking

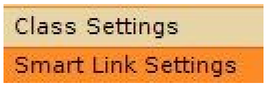
Smart Link is a feature in Metro 6.1.4 that allows native Metro widgets to communicate with Widget API widgets, such as the Advanced Order App. Users can configure widgets to communicate this and each widget supports different behavior when sending and receiving messages via Smart Link. More on that topic can be found here.

Configuring the Advanced Order App for Smart Link

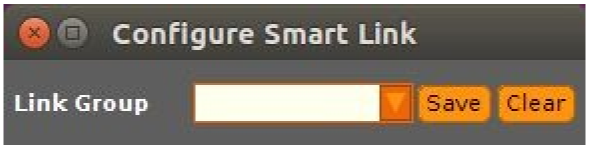
To configure the Advanced Order App to communicate with a Link Group, locate the Settings button in the upper-left corner of the app. It should look like:



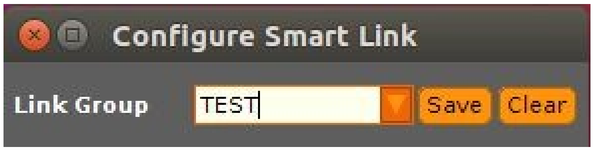
Clicking on this will load the settings menu:



Select ***Smart Link Settings***. This launches the following simple configuration menu:

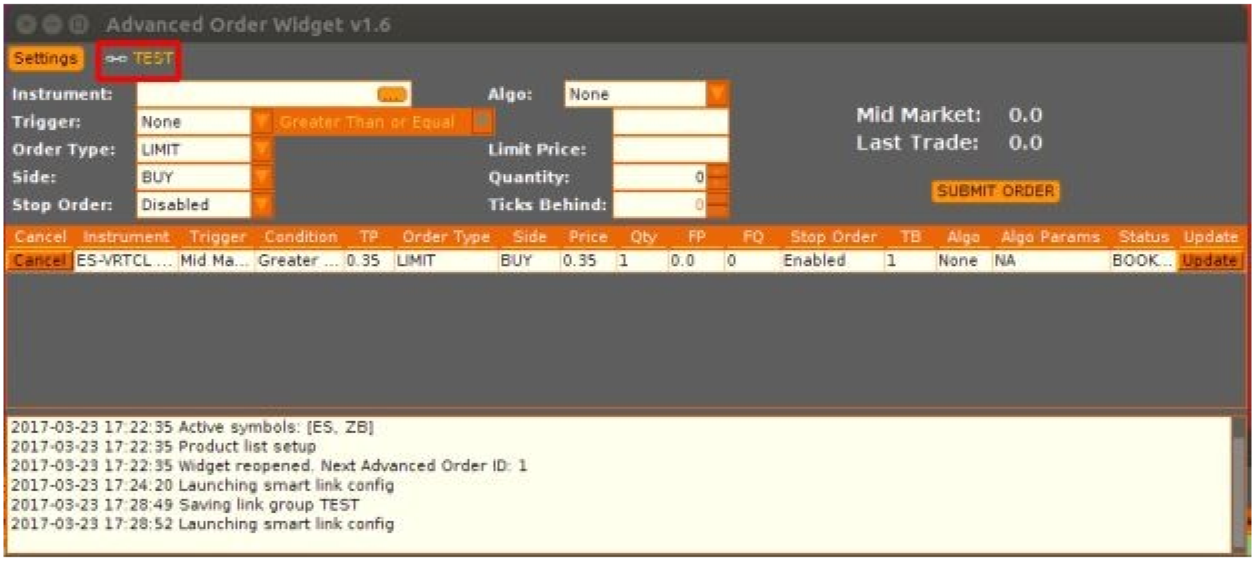


The drop-down box displays all smart Link Groups currently set in other widgets. A ***Link Group*** is a simple string of characters that links various widgets. You may also type in a new Link Group to use for this app. We will use the Link Group 'TEST':



Link Group TEST

Clicking save will save the link group for the app. Clicking clear will clear out the Link Group text box but will not overwrite your saved Link Group. Once you click save, the dialog will close, and you will notice the link group in your menu bar:



Instrument:
Trigger: None Greater Than or Equal
Order Type: LIMIT
Side: BUY
Stop Order: Disabled
Algo: None
Limit Price:
Quantity: 0
Ticks Behind: 0
Mid Market: 0.0
Last Trade: 0.0

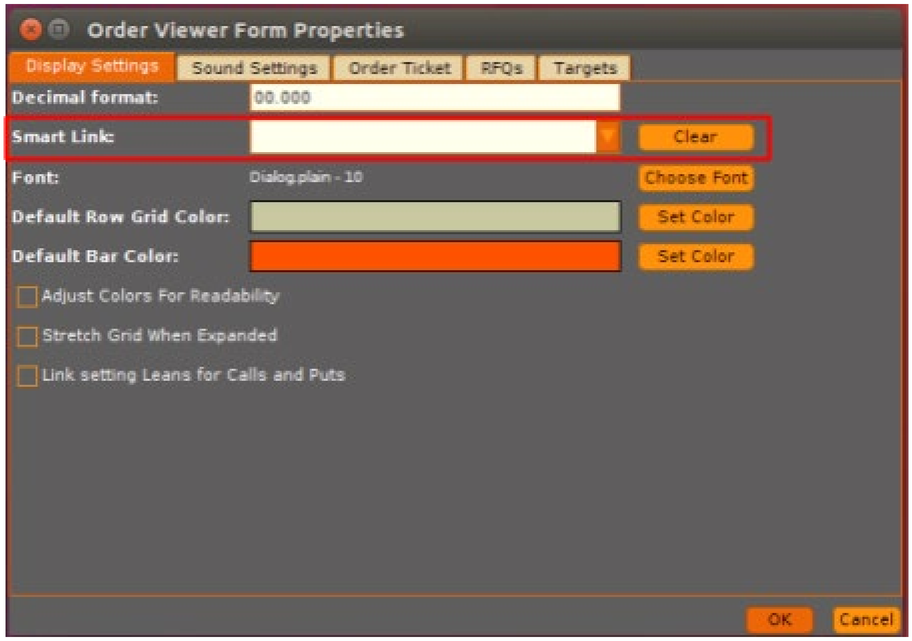
Cancel	Instrument	Trigger	Condition	TP	Order Type	Side	Price	Qty	FP	FQ	Stop Order	TB	Algo	Algo Params	Status	Update
Cancel	ES-VRTCL ...	Mid Ma...	Greater ...	0.35	LIMIT	BUY	0.35	1	0.0	0	Enabled	1	None	NA	BOOK...	Update

```
2017-03-23 17:22:35 Active symbols: [ES, ZB]
2017-03-23 17:22:35 Product list setup
2017-03-23 17:22:35 Widget reopened. Next Advanced Order ID: 1
2017-03-23 17:24:20 Launching smart link config
2017-03-23 17:28:49 Saving link group TEST
2017-03-23 17:28:52 Launching smart link config
```

At this point, your Advanced Order App is ready to send and receive messages between other widgets in the ***'TEST'*** link group.

Advanced Order App Smart Link Behavior

When the Advanced Order App is linked, any instrument selected in the instrument selection box, or selected from the Advanced Order view table will be sent to other widgets in the link group. To ensure those widgets are in the link group, click ***Settings*** in the corresponding widget, which launches the following menu:



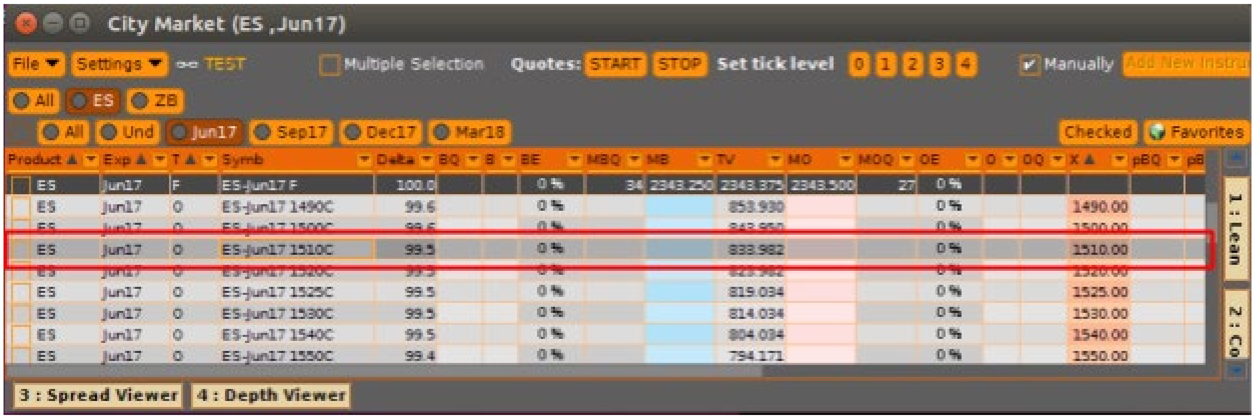
Decimal format: 00.000
Smart Link:
Font: Dialog.plain - 10
Default Row Grid Color:
Default Bar Color:

□ Adjust Colors For Readability
□ Stretch Grid When Expanded
□ Link setting Leans for Calls and Puts

In the Smart Link text box, either select the appropriate link group (‘TEST’ in this case) or type it in. Then click ***ok***. The exact interactions with other widgets are explained here, but below are some interactions that are felt to be relevant to the Advanced Order Use Cases:

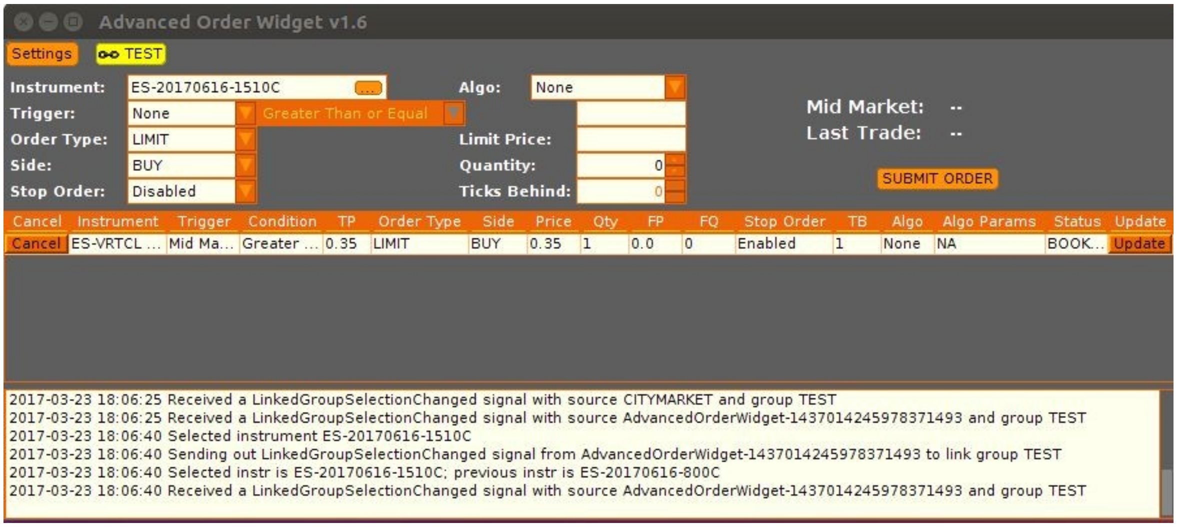
Metro App Store

When linked to a Metro App Store any selected instrument in the Advanced Order App (whether in the instrument selection box, or in the order view table) will become highlighted in the Metro App Store market view table, if the appropriate product is selected. For example, if we pick ES-Jun17-1510C in the Advanced Order App instrument selection box, the corresponding cell will become watermarked in Metro App Store if and only if the Metro App Store is set to ES Jun17:



Product	Exp	T	Symb	Delta	BQ	B	BE	MBQ	MB	TV	MO	MOQ	OE	O	OQ	X	pBQ	pB
ES	Jun17	F	ES-Jun17 F	100.0			0 %	34	2343.250	2343.375	2343.500	27	0 %					
ES	Jun17	O	ES-Jun17 1490C	99.6			0 %			853.930			0 %			1490.00		
ES	Jun17	O	ES-Jun17 1500C	99.6			0 %			843.950			0 %			1500.00		
ES	Jun17	O	ES-Jun17 1510C	99.5			0 %			833.982			0 %			1510.00		
ES	Jun17	O	ES-Jun17 1520C	99.5			0 %			823.982			0 %			1520.00		
ES	Jun17	O	ES-Jun17 1525C	99.5			0 %			819.034			0 %			1525.00		
ES	Jun17	O	ES-Jun17 1530C	99.5			0 %			814.034			0 %			1530.00		
ES	Jun17	O	ES-Jun17 1540C	99.5			0 %			804.034			0 %			1540.00		
ES	Jun17	O	ES-Jun17 1550C	99.4			0 %			794.171			0 %			1550.00		

Conversely, selecting any cell (left of the strike columns will be calls, right of the strike column will be puts) in the Metro App Store will set the instrument in the Advanced Order App instrument selection box to that instrument:



Instrument: ES-20170616-1510C
Trigger: None | Greater Than or Equal
Order Type: LIMIT
Side: BUY
Stop Order: Disabled
Algo: None
Limit Price:
Quantity: 0
Ticks Behind: 0
Mid Market: --
Last Trade: --

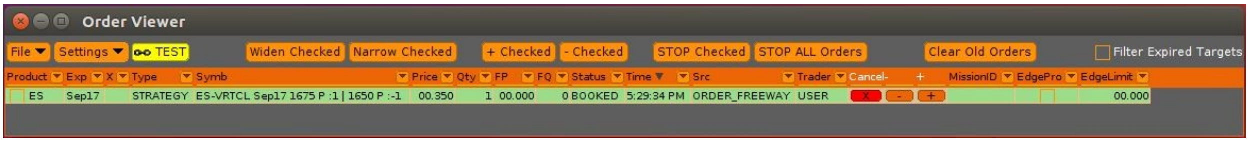
Cancel	Instrument	Trigger	Condition	TP	Order Type	Side	Price	Qty	FP	FQ	Stop Order	TB	Algo	Algo Params	Status	Update
Cancel	ES-VRTCL ...	Mid Ma...	Greater ...	0.35	LIMIT	BUY	0.35	1	0.0	0	Enabled	1	None	NA	BOOK...	Update

```
2017-03-23 18:06:25 Received a LinkedGroupSelectionChanged signal with source CITYMARKET and group TEST
2017-03-23 18:06:25 Received a LinkedGroupSelectionChanged signal with source AdvancedOrderWidget-1437014245978371493 and group TEST
2017-03-23 18:06:40 Selected instrument ES-20170616-1510C
2017-03-23 18:06:40 Sending out LinkedGroupSelectionChanged signal from AdvancedOrderWidget-1437014245978371493 to link group TEST
2017-03-23 18:06:40 Selected instr is ES-20170616-1510C; previous instr is ES-20170616-800C
2017-03-23 18:06:40 Received a LinkedGroupSelectionChanged signal with source AdvancedOrderWidget-1437014245978371493 and group TEST
```

Moreover, the Link Group button will highlight yellow indicating that the app's view has been filtered to the selected instrument from the Metro App Store. Clicking on this will undo the filter and restore the selected instrument to the previously selected instrument.

Order Viewer

The native Metro Order Viewer also supports Smart Link. Clicking on any row in the order viewer table will send the instrument on that order to the Advanced Order App instrument selection box. Conversely any instrument clicked on in the Advanced Order App (whether in the instrument selection box, or in the order view table) will be sent to the Order Viewer, filtering table view out:



Product	Exp	X	Type	Symb	Price	Qty	FP	FQ	Status	Time	Src	Trader	Cancel-	+	MissionID	EdgePro	EdgeLimit
□ ES	Sep17		STRATEGY	ES-VRTCL Sep17 1675 P :1 | 1650 P :-1	00.350	1	00.000	0	BOOKED	5:29:34 PM	ORDER_FREEWAY	USER	X -	+		□	00.000

As in the case with the Advanced Order App, the link button will become yellow, indicating that the widget view is being filtered to the instrument selected in the Advanced Order App.