

# Algorithmic Trading

## QUICK REFERENCE GUIDE



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# SUMMARY

## ALGORITHMIC TRADING

### ADAPTIVE ALGOS

<b>AMBUSH®</b>	Discretely probes the market for swift execution of an order.
<b>GETDONE (OPLX)</b>	Aggressive, liquidity seeking algorithm that attempts to complete orders quickly and efficiently via both dark pools and visible markets.
<b>INSTINCT®</b>	Particularly suitable for small and mid-cap names; will respond to real-time liquidity events to optimize participation and limit order placement.

### SCHEDULING ALGOS

<b>VWAP</b>	Executes an order over a specified time interval to achieve a volume-weighted average execution price.
<b>TWAP (CLOCK)</b>	Executes an order in equally-sized slices over a specified time interval to achieve a time-weighted average execution price.
<b>POV</b>	Tracks market volume to ensure a specified target participation rate.

### ARRIVAL ALGOS

<b>SMART DMA (WALK)</b>	Exhausts liquidity at each price level up to the limit price of the order and then posts any residual quantity over multiple venues.
<b>I/S (OPL)</b>	Uses market impact estimates to schedule a trade in order to minimize implementation shortfall.
<b>QIS</b>	Minimizes implementation shortfall using proprietary market impact model.

### CROSSING ALGOS

<b>BLOCKSEEKER</b> (Active, Passive, Aggressive)	Dark pool aggregator that uses crossing networks, hidden order types, and anti-gaming pricing logic to stealthily execute an order.
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### SCALING ALGOS

<b>MOMENTUM</b>	Increases participation rate as price moves away from arrival price.
<b>REVERSION</b>	Increases participation rate as price moves in your favor.

### AUCTION ALGOS

<b>QMOC</b>	Executes an order into the close to minimize market impact and time risk.
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## WHAT IT DOES

- **Aggressive, liquidity-seeking algorithm** that attempts to complete orders via both dark pools and visible markets.
- **Monitors order impact vs. historical volatility** to tune order placement timing.
- **Takes liquidity without posting displayed orders.**

## USER CONTROLS

Name	Description	Default
Start Time	Time of day the order commences execution.	User Local Time
End Time	Time of day the order expires.	User Local Time
Aggression	Strategy aggressiveness level.	Neutral

## PERFORMANCE NOTES

- Limit prices are recommended.
- Execution mode affects wait time sensitivity.
- Does not participate at the open or at the close.
- Default is no posting but configuration to post is available.
- Participation can be high if liquidity is present.
- Order completion is not guaranteed.

## TRY USING:

... when trying to increase or decrease a position quickly.

... to extract liquidity without leaving a footprint.

... as an alternative to GETDONE if more concerned with price impact than order completion.

# GETDONE (OPL-X) - Quick, Efficient Execution

ALGORITHMIC TRADING

## WHAT IT DOES

- **Aggressive, liquidity-seeking algorithm** that attempts to complete orders via both dark pools and visible markets.
- **Extremely responsive to changes** in stock price and available liquidity.
- **Tries to complete on the offer (when buying)** if available liquidity permits.
- **Continues to seek out liquidity on the offer using aggressive slices** if the order cannot be completed immediately.
- **Passive component will peg to the bid** if the order cannot be completed immediately.
- **Intelligently manages the display size** if the user does not provide that parameter.

## USER CONTROLS

Name	Description	Default
Start Time	Time of day the order commences execution.	User Local Time
End Time	Time of day the order expires.	User Local Time
Aggression	Level of urgency for the order.	Medium
Display Size	Maximum share quantity to display in the market (set to zero (0) for No Posting).	Merrill-determined
Auction	Participate On Open.	Yes
Participation	Participate On Close.	No
Crossing	Exposes order to dark pool execution. Configurable.	Yes

## PERFORMANCE NOTES

- Works well under all types of market conditions.
- Particularly effective if you need to be done quickly in a volatile or fast-moving market.
- Offers performance improvements over a straight “at market” or “DMA” strategy, particularly where the order is large relative to available liquidity.

**TRY USING:** ... when you need to be done quickly.

... the No-Post option to minimize your footprint.

... tighter limit prices for less liquid names.

... with crossing parameters to access dark pools.

... as an alternative to Ambush if more concerned with order completion.

## WHAT IT DOES

- **Takes advantage of liquidity events** in an opportunistic fashion.
- **Monitors real-time price** and speeds up or slows down based on price movement.
- **Follows a minimum target completion rate** based on execution mode.

## USER CONTROLS

Name	Description	Default
Start Time	Time of day the order commences execution.	User Local Time
End Time	Time of day the order expires.	User Local Time
Aggression	Strategy aggressiveness level.	Neutral
Max % of Volume	Maximum participation rate.	
Complete Today	Forces completion of an Instinct order.	Off
Auction	Participate on Open.	Yes
Participation	Participate on Close.	No

## PERFORMANCE NOTES

- Well suited for small and mid cap names.
- Does not participate at the close.
- Order completion is not guaranteed.
- Maximum participation rates are configurable.

## TRY USING:

... when trying to reduce market impact but keen to exploit liquidity bursts.

... when trading stocks with inconsistent liquidity patterns.

... when you don't need to be complete today.

# VWAP – Volume-Weighted Average Price

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## WHAT IT DOES

- Executes an order over a specified time interval to achieve VWAP.
- Schedules a trade according to the historical and predicted volume and volatility profile of the individual stock.

## USER CONTROLS

Name	Description	Default
Start Time	Time of day the order commences execution.	User Local Time
End Time	Time of day the order expires.	User Local Time
Max % of Volume	Maximum participation rate.	No Default
Auction	Participate On Open.	Yes
Participation	Participate On Close.	No
Crossing	Exposes order to dark pool execution. Configurable.	MLXN-only

## PERFORMANCE NOTES

- Works well under normal market conditions.
- Use with caution in volatile markets where actual volume patterns may differ greatly from historical patterns, as this may increase price variance to VWAP.
- Benchmark performance improves in names with tighter spreads and more predictable volume patterns.
- Generally, VWAP performs better and has higher crossing rates over longer trading periods.
- Market slices are randomized based on stock-specific profiles.
- Volume profiles are adjusted for special trading days such as options expiry.

## TRY USING:

... when you have no directional view.  
... when urgency is not a factor.

... when you have larger orders that need to complete, but want to minimize impact.

... with crossing parameters to access dark pools (may cause the order to complete early).

# TWAP (CLOCK) – Time-Weighted Average Price

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## WHAT IT DOES

- Executes an order in equally-sized slices over a specified time interval.
- Determines slice interval based upon duration of the entire order.

Order Duration	Slice Every
< 15 minutes	1 minute
15-29 minutes	3 minutes
> 30 minutes	5 minutes

## USER CONTROLS

Name	Description	Default
Start Time	Time of day the order commences execution.	User Local Time
End Time	Time of day the order expires.	User Local Time
Max % of Volume	Maximum participation rate.	No Default
Auction	Participate On Open.	Yes
Participation	Participate On Close.	No
Crossing	Exposes order to dark pool execution. Configurable.	MLXN-Only

## PERFORMANCE NOTES

- Can be configured to slice either more or less granularly than the standard slicing interval.
- A good choice when volumes are either abnormal or uncertain.

**TRY USING:** ... when you want to spread out an order over a specified time frame, but do not want to track stock-specific volume patterns.

... when you have no directional view and you want time-based participation rather than VWAP.  
... to unwind a stock vs. a futures position.

... for basket trading, to maintain dollar neutrality over time.  
... with crossing parameters to access dark pools (may cause the order to complete early).



## WHAT IT DOES

- Tracks market volume to ensure a specified target participation rate.
- Manages orderly “catch-up” on block prints or excessive volume to reduce potential impact.

## USER CONTROLS

Name	Description	Default
Start Time	Time of day the order commences execution.	User Local Time
End Time	Time of day the order expires.	User Local Time
Target % of Volume	Target participation rate (required value).	No Default
Auction	Participate On Open.	Yes
Participation	Participate On Close.	No
Crossing	Exposes order to dark pool execution. Configurable.	MLXN-Only
Speed Up	Price level at which participation will increase.	No Default

## PERFORMANCE NOTES

- Works well in many different types of market conditions.
- Performs best on names with tighter spreads and higher trade frequency.
- Ensures participation during price moves in a relatively fast-moving market.
- Tightly constrained by volume traded in the market and quickly responds to printed volume.
- May sacrifice price improvement opportunities for more rigid volume tracking.
- Order may not complete by end of day.

## TRY USING:

... when you want to maintain a specific participation rate over the duration of the order.

... speed-up parameters to adjust the participation rate.

... with crossing parameters to access dark pools (will increase overall participation rate).

# SMART DMA (WALK) – Smart Order Routing Strategy

ALGORITHMIC TRADING

## WHAT IT DOES

- **Starting at the inside, exhausts both displayed and reserve liquidity** at each price level up to the limit price of the order.
- **Intelligently posts any residual quantity across multiple venues** as determined by various factors, including:
  - Current Opposite Side Liquidity
  - Venue Market Share
  - Average Queue Time
- **Redistributes residual posted share quantities dynamically**, as executions occur.
- **Optional dark pool access.**

## USER CONTROLS

Name	Description	Default
Trading Session	Supports day, pre-open, & after hours.	Day
SCAN	Scan dark pools for midpoint liquidity before crossing the spread.	Yes
Display Size	Maximum share quantity to display in the market (set to zero (0) for No Posting).	Merrill-determined
Auction	Participate On Open.	Yes
Participation	Participate On Close.	No

## PERFORMANCE NOTES

- Merrill's most aggressive strategy.
- Works well in many different types of market conditions.
- Especially useful in fast markets where more complete control of orders is desired.
- May be configured for pre- and post-market trading from 7:30am to 5:30pm EST. Limits are required when trading outside of regular market hours.

**TRY USING:** ... if you want the order to be done as quickly as possible.

... as a better alternative to DMA via one specific destination.

... limit prices where impact may be a concern.

... when you are cleaning up residuals.

... the “SCAN” option to seek out dark pool liquidity at the midpoint.

# I/S (OPL) – Implementation Shortfall

ALGORITHMIC TRADING

## WHAT IT DOES

- **Uses market impact estimates to schedule a trade** in order to minimize implementation shortfall.
- **Makes use of historical and predicted stock specific volume and volatility profiles.**
- **Dynamically adjusts trade schedule** according to actual market conditions.
- **May have multiple child orders “laddered” on the book** based on volatility and average queue time.
- **Determines the optimal trading duration** if no end time is provided.
- **Seeks to complete all orders by end of day** in the absence of a limit price or volume constraint.

## USER CONTROLS

Name	Description	Default
Start Time	Time of day the order commences execution.	User Local Time
End Time	Time of day the order expires.	User Local Time
Aggression	Level of urgency for the order. Approx. Participation Rate: <b>Low</b> - 10%, <b>Medium</b> - 20%, <b>High</b> - 30%	Medium
Min % of Vol	Minimum participation rate.	Optional
Max % of Vol	Maximum participation rate.	Optional
Auction	Participate On Open.	Yes
Participation	Participate On Close.	No
Crossing	Exposes order to dark pool execution. Configurable.	MLXN-Only
Speed Up	Price level at which participation will increase.	No Default

## PERFORMANCE NOTES

- Well-suited to both normal and trending markets.
- Adjusts well to intra-day changes in volume and volatility patterns.
- Performs well in stocks with larger bid/offer sizes because the strategy also considers average length of time on the book.
- Price improvement component is particularly effective for more volatile names.

**TRY USING:** ... to balance price impact with opportunity costs.  
... as an “in-line” alternative to VWAP when you don’t have a directional view.

... when willing to sacrifice rigid tracking of volume (POV strategy) for more opportunities for price improvement.

... speed-up parameters to adjust the participation rate.  
... with crossing parameters to access dark pools.

## WHAT IT DOES

- **Uses Merrill Lynch proprietary market impact estimates to schedule a trade** in order to minimize implementation shortfall.
- **Trades in discontinuous bursts.**
- **Dynamically adjusts trade schedule, speed, and order book strategy** according to actual market conditions.
- **May have multiple child orders “laddered” on the book** based on volatility and average queue time.
- **Determines the optimal trading duration** if no end time is provided.
- **Seeks to complete all orders by end of day** in the absence of a limit price or max % volume.

## USER CONTROLS

Name	Description	Default
<b>Start Time</b>	Time of day the order commences execution.	User Local Time
<b>End Time</b>	Time of day the order expires.	User Local Time
<b>Aggression</b>	Level of urgency for the order. Approx. Participation Rate: <b>Low</b> -10%, <b>Medium</b> -20%, <b>High</b> -30%	Medium
<b>Min % of Vol</b>	Minimum participation rate.	Optional
<b>Max % of Vol</b>	Maximum participation rate.	Optional
<b>Auction Participation</b>	Participate On Open. Participate On Close.	Yes No
<b>Crossing</b>	Exposes order to dark pool execution. Configurable.	MLXN-Only
<b>Speed Up</b>	Price level at which participation will increase.	No Default

## PERFORMANCE NOTES

- Well-suited to both normal and trending markets.
- Adjusts well to intra-day changes in volume and volatility patterns.
- Front-loads a large percentage of the order at the start of the trade to minimize opportunity cost.
- Performs well in stocks with larger bid/offer sizes because the strategy also considers average length of time on the book.
- Price improvement component is particularly effective for more volatile names.

## TRY USING:

... to minimize the impact for orders which are a large percentage of average daily volume and must be completed.

... from middle of trading session onward.

... in the final hour of the trading day.

# BLOCKSEEKER (Passive Mode) – Dark Pool Aggregator

ALGORITHMIC TRADING

## WHAT IT DOES

- **Uses crossing networks including MLXN and hidden order types** to stealthily execute an order.
- **Initially, orders are split between pools based on venue-specific historical and real-time statistics.** Quantities are reallocated as executions are received.
- **Uses short-term volume and volatility statistics** to protect against gaming.

## USER CONTROLS

Name	Description	Default
Start Time	Time of day the order commences execution.	User Local Time
End Time	Time of day the order expires.	User Local Time
Min Cross Qty	Minimum fill size per execution.	None
MLXN-only	Order to be filled via MLXN only.	Disabled
Clean-up	Residual shares or percent of order quantity to complete the order in the visible market.	Odd Lots Only

## PERFORMANCE NOTES

- Default pricing is either midpoint or better.
- Fill rate will vary based on the chosen mix of dark pools and ECN hidden order types.
- Limits are advisable in volatile markets.
- Does not participate in the opening or closing auction.

**TRY USING:** ... if you are concerned about price impact.

... in illiquid names or with larger positions in liquid names.

... when you don't need to be complete.

... immediately after the open, when dark pool volumes are at their peak.

# BLOCKSEEKER (Active Mode) – Opportunistic Liquidity Taker

ALGORITHMIC TRADING

## WHAT IT DOES

- **Uses crossing networks including MLXN and hidden order types** to stealthily execute an order.
- **Responds to significant liquidity events in the displayed marketplace.** Triggers are:
  - Excess volume traded vs. moving average
  - Excess size displayed vs. moving average of opposite quote size
- **Never posts in the visible market.**
- **When a liquidity event occurs, the strategy will take up to 80% of the total size displayed at the inside.**
- **Uses short-term volume and volatility statistics** to protect against gaming.

## USER CONTROLS

Name	Description	Default
Start Time	Time of day the order commences execution.	User Local Time
End Time	Time of day the order expires.	User Local Time
Min Cross Qty	Minimum fill size per execution.	None
Clean-up	Residual shares or percent of order quantity to complete the order in the visible market.	Odd Lots Only

## PERFORMANCE NOTES

- Fill rate will vary based on the chosen mix of dark pools and ECN hidden order types.
- Limits are advisable in volatile markets.
- Does not participate in the opening or closing auction.

**TRY USING:** ... **if you are concerned about price impact** but don't want to risk missing significant liquidity opportunities in the visible markets.

... **in illiquid names** or with larger positions in liquid names.

... **when you don't need to be complete.**  
... **immediately after the open**, when dark pool volumes are at their peak.

# BLOCKSEEKER (Aggressive Mode) – Stealthy Execution

ALGORITHMIC TRADING

## WHAT IT DOES

- **Aggressively takes liquidity in both dark and visible pools** while limiting market impact.
- **Never posts in the visible market.**
- **Reduces participation rate** if market impact occurs.

## USER CONTROLS

Name	Description	Default
Start Time	Time of day the order commences execution.	User Local Time
End Time	Time of day the order expires.	User Local Time
Min Cross Qty	Minimum fill size per dark execution.	None
Clean-up	Residual shares or percent of order quantity to complete the order in the visible market.	Odd Lots Only
Auction	Participate On Open.	Yes
Participation	Participate On Close.	No

## PERFORMANCE NOTES

- Suitable for use throughout the day.
- Fill rate will vary based on the chosen mix of dark pools and ECN hidden order types.
- Limits are advisable in volatile markets.
- Will participate in the opening auction.

## TRY USING:

... when stealthy execution is desirable but urgency is a factor.

... as a more aggressive alternative when looking to complete inline.

## MOMENTUM™

### WHAT IT DOES

- **Uses** market impact estimates to schedule a trade in order to minimize implementation shortfall.
- **Increases participation rate** as price moves away from arrival price.

### PERFORMANCE NOTES

- Works best in trending markets or when significant news hits the tape and traders rush to initiate or cover positions.
- There are no user controls for this strategy.

### TRY USING:

... when you perceive price momentum in the stock.

## REVERSION™

### WHAT IT DOES

- **Uses market impact estimates to schedule a trade** in order to minimize implementation shortfall.
- **Increases participation rate** as price moves in your favor.

### PERFORMANCE NOTES

- Works best in oscillating markets or when low liquidity causes price fluctuation in the absence of news.
- There are no user controls for this strategy.

### TRY USING:

... when you expect the price of the stock to revert to an earlier level after temporary dislocation.



## WHAT IT DOES

- **Executes an order into the close** to minimize market impact and time risk.
- **Uses the volatility and liquidity characteristics of the stock** to schedule a trade that strikes a balance between variance to the closing price and market impact.

## USER CONTROLS

Name	Description	Default
<b>Start Time</b>	Earliest possible time to start execution.	Merrill-determined
<b>MOC-only</b>	Trade entire order quantity in the closing auction.	No
<b>Aggression</b>	Level of urgency for the order– Trade Early, Standard, Late.	Standard
<b>Auction Participation</b>	Participate On Open. Participate On Close.	No Yes

## PERFORMANCE NOTES


- Will participate in the closing auction if orders are received before the on-close cut off times (15:40 for Listed, 15:50 for OTC).
- May not be suitable where closing volumes or price levels are expected to be particularly volatile, e.g., index re-weighting events.
- Volume profiles are adjusted for special trading days, such as options expiry.

## TRY USING:

... a limit price to control impact (risk of residuals).

... to manage impact when benchmarked to the close in less liquid names.

... when you miss the on-close cut-off time, but remain benchmarked to the closing price.

A large, stylized, light blue graphic of a bull's head, facing right, occupies the left side of the page. It is composed of simple, rounded shapes, giving it a modern, abstract appearance. The bull's head is the central focus of the graphic, with its horns and ears integrated into the overall design.

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