



# StrategyHound

## TradingApp

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 TradeStation®

# CONTENTS

<b>StrategyHound</b>	<b>2</b>
Layout	2
Using StrategyHound	4
<b>Symbols</b>	<b>5</b>
<b>Intervals</b>	<b>6</b>
<b>Strategies</b>	<b>7</b>
<b>Signals</b>	<b>8</b>
<b>Inputs</b>	<b>9</b>
<b>Intrabar Order Generation</b>	<b>10</b>
<b>Backtesting Settings</b>	<b>11</b>
General	11
Fill Assumptions	14
<b>Settings</b>	<b>16</b>
<b>Index</b>	<b>18</b>

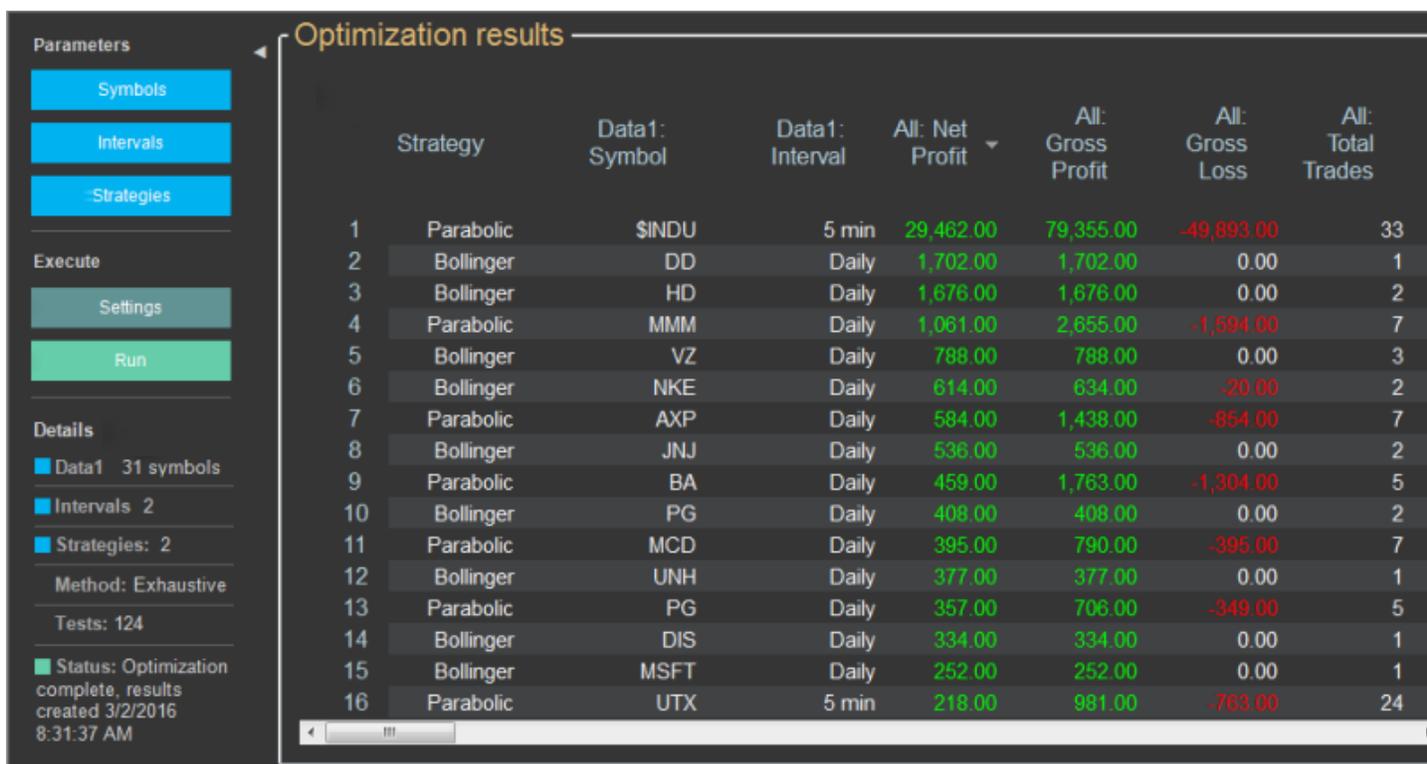
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# StrategyHound TradingApp

StrategyHound is a TradingApp that allows you to use the powerful strategy optimization features in TradeStation to find trading opportunities by evaluating multiple strategies and intervals across multiple markets in a single integrated tool. With StrategyHound, you simply specify a list of symbols, along with the intervals and strategies of interest, and then click Run. It evaluates all possible permutations and presents you with an easy-to-read report that displays each permutation along with its associated fitness values such as Net Profit, Maximum Intraday Drawdown and Profit Factor. You can then sort by any fitness value to find the combination of symbols, intervals and strategies that provides the best results according to your own trading criteria.

 The StrategyHound TradingApp is available from the TradingApp® Store.

- ▶ Access by clicking the StrategyHound icon from the TradingApps launcher. A new StrategyHound window is displayed.



The screenshot displays the StrategyHound TradingApp interface. On the left, there is a sidebar with sections: Parameters (Symbols, Intervals, Strategies), Execute (Settings, Run), and Details (Data1: 31 symbols, Intervals: 2, Strategies: 2, Method: Exhaustive, Tests: 124, Status: Optimization complete, results created 3/2/2016 8:31:37 AM). The main area is titled "Optimization results" and contains a table with the following data:

	Strategy	Data1: Symbol	Data1: Interval	All: Net Profit	All: Gross Profit	All: Gross Loss	All: Total Trades
1	Parabolic	\$INDU	5 min	29,462.00	79,355.00	-49,893.00	33
2	Bollinger	DD	Daily	1,702.00	1,702.00	0.00	1
3	Bollinger	HD	Daily	1,676.00	1,676.00	0.00	2
4	Parabolic	MMM	Daily	1,061.00	2,655.00	-1,594.00	7
5	Bollinger	VZ	Daily	788.00	788.00	0.00	3
6	Bollinger	NKE	Daily	614.00	634.00	-20.00	2
7	Parabolic	AXP	Daily	584.00	1,438.00	-854.00	7
8	Bollinger	JNJ	Daily	536.00	536.00	0.00	2
9	Parabolic	BA	Daily	459.00	1,763.00	-1,304.00	5
10	Bollinger	PG	Daily	408.00	408.00	0.00	2
11	Parabolic	MCD	Daily	395.00	790.00	-395.00	7
12	Bollinger	UNH	Daily	377.00	377.00	0.00	1
13	Parabolic	PG	Daily	357.00	706.00	-349.00	5
14	Bollinger	DIS	Daily	334.00	334.00	0.00	1
15	Bollinger	MSFT	Daily	252.00	252.00	0.00	1
16	Parabolic	UTX	5 min	218.00	981.00	-763.00	24

## Layout

The left side of the StrategyHound window contains groups of controls that let you specify the optimization parameters, execute settings and view a summary of the most recently run strategy optimization. The right side of the window displays the progress and results when the optimization is run.

	Strategy	Data1: Symbol	Data1: Interval	All: Net Profit	All: Gross Profit	All: Gross Loss	All: Total Trades
1	Parabolic	\$INDU	5 min	29,462.00	79,355.00	-49,893.00	33
2	Bollinger	DD	Daily	1,702.00	1,702.00	0.00	1
3	Bollinger	HD	Daily	1,676.00	1,676.00	0.00	2
4	Parabolic	MMM	Daily	1,061.00	2,655.00	-1,594.00	7
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10	Bollinger	PG	Daily	408.00	408.00	0.00	2
11	Parabolic	MCD	Daily	395.00	790.00	-395.00	7
12	Bollinger	UNH	Daily	377.00	377.00	0.00	1
13	Parabolic	PG	Daily	357.00	706.00	-349.00	5
14	Bollinger	DIS	Daily	334.00	334.00	0.00	1
15	Bollinger	MSFT	Daily	252.00	252.00	0.00	1
16	Parabolic	UTX	5 min	218.00	981.00	-763.00	24

- 1 Symbols** – Opens the [Symbols](#) dialog where you add symbols to use for the strategy optimizations
- 2 Intervals** – Opens the [Optimization Intervals](#) dialog where you list the intervals to be tested.
- 3 Strategies** – Opens the [Strategies](#) dialog where you add named strategies representing groups of strategy components (signals).
- 4 Settings** – Opens the [Optimization Settings](#) dialog used to identify the optimization method and related settings.
- 5 Run** – Click (when active) to start executing the optimization. The Optimization Progress display appears in the Optimization Results area (#6) prior to the results being displayed. Also, while running, the button name changes to Cancel and can be used to end the optimization run and display partial results.
- 6 Optimization Results** – A listing of the Optimization Results sorted based on the column containing the up or down arrow to the right of the column name. The default sort column is specified in the Settings (see above). Click any column header to make it the sort column or to change the sort order.
- 7 Details** – Summarizes the scope of the optimization and the status of last time it was run.
- 8 Collapse/Expand** – Click to hide or show the Layout pane.

**Optimization progress**

Status: **Optimizing**

Strategy/Interval(10 of 20): Key Reversal Daily, 2 years back, Last date is 2/19/2016

Elapsed time(H:M:S) 00:00:36

Remaining time(H:M:S) 00:00:44

Test count 600

Test number 286

Generation count N/A

Generation number N/A

Individual number N/A

Population size N/A

Fitness name All: Net Profit

Best fitness value 10,656.00

## Using StrategyHound

The following steps are used in StrategyHound to set up your optimization and to generate a report.

1. Click **Symbols** and specify the list of symbols to evaluate.
2. Click **Intervals** and specify one or more bar intervals to be tested for all symbols.
3. Click **Strategies** to create named strategies consisting of signals (strategy components) and the how they should be optimized.
4. Click **Settings** to review the optimization method and to change any settings before the optimization is run.
5. Click **Run** to begin the optimization process and generate the report.
6. Review the **Optimization Results** report and click any column heading to sort the results.

Parameters

**Symbols**

**Intervals**

**Strategies**

---

Execute

**Settings**

**Run**

---

Details

■ Data1 31 symbols

■ Intervals 2

■ Strategies: 2

Method: Exhaustive

Tests: 124

■ Status: Optimization complete, results created 3/2/2016 8:31:37 AM

### Optimization results

	Strategy	Data1: Symbol	Data1: Interval	All: Net Profit	All: Gross Profit	All: Gross Loss	All: Total Trades
1	Parabolic	\$INDU	5 min	29,462.00	79,355.00	-49,893.00	33
2	Bollinger	DD	Daily	1,702.00	1,702.00	0.00	1
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16	Parabolic	UTX	5 min	218.00	981.00	-763.00	24

## Related Topics

[About the TradingApp® Store](#)

# SYMBOLS

The Symbols dialog is used to select and view the list of symbols that are to be used for a StrategyHound optimization.

▶ Access it using the **Symbols** button in the [StrategyHound](#) window.

## Data Tabs

Contains the collection of symbols to optimize. By default, symbols are associated with Data1. Click on the empty tab add symbols to another data stream (Data2, Data3, etc.) if needed by a given strategy.

<Enter symbol> – Select and use the keyboard to type in a new symbol, then press Enter.

+ Click to select one of the following methods for adding symbols:

**Insert from a symbol list** – Opens the Insert Symbol List dialog that allows you to load symbols from one or more Symbol Lists.

**Paste Symbols** – Opens an empty Symbols box into which you can paste symbols that have been copied from RadarScreen®, Hot Lists®, a spreadsheet or a column of symbols in a text file.

x Click to remove a symbol from the symbol collection.

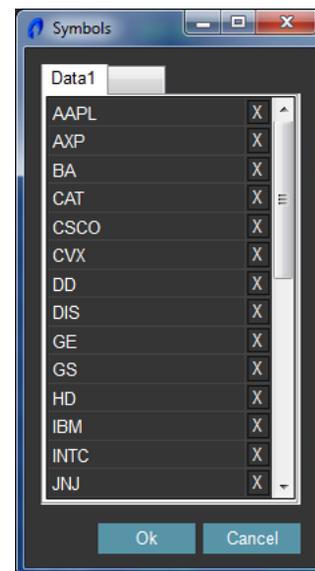
▶ Click **OK** to save the selected symbols or **Cancel** to exit without changes.

## Related Topics

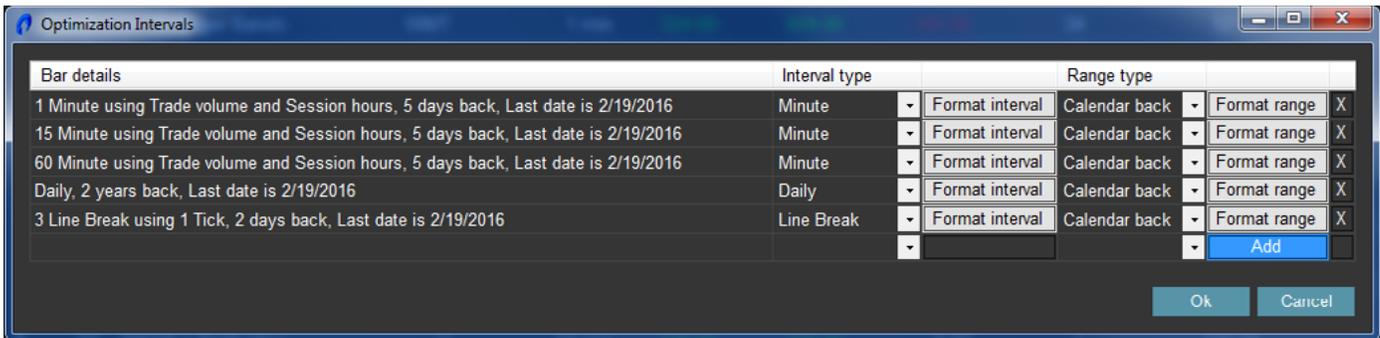
[StrategyHound – Intervals](#)

[StrategyHound – Strategies](#)

[StrategyHound – Settings](#)



# INTERVALS



The Optimization Intervals dialog lists one or more bar intervals that will be applied to each symbol and strategy in a StrategyHound optimization.

▶ Access using the **Intervals** button in the [StrategyHound](#) TradingApp window.

**Add** – Click to create a new interval row.

**Bar Details** – This column describes the bar interval and parameters for each row.

**Interval type** – Use the drop-down list in each row to select the interval type (i.e., Minute, Daily, Point & Figure, etc.) for that row.

**Format interval** – Click in each row to change the settings for that row’s interval type (if allowed). These are similar to the interval settings you would use for a symbol in a chart. Check Set as default to make these the default settings for this type.

**Range type** – Use the drop-down list in each row to select the optimization range (time period) for that row.

- **Calendar back** – Specifies the number of Days, Weeks or Months from the Last Date to use for the range.
- **Bars back** – Specifies the number of bars back from the Last Date to use for the range.
- **First date** – Specifies the First date and Last date of the range

**Format range** – Click in each row to change the settings for that row’s range type. These are similar to the range settings you would use for a symbol in a chart. Check Set as default to make these the default settings for this type.

✕ Click to remove an interval row from the list.

▶ Click **OK** to apply changes or **Cancel** to exit without changes.

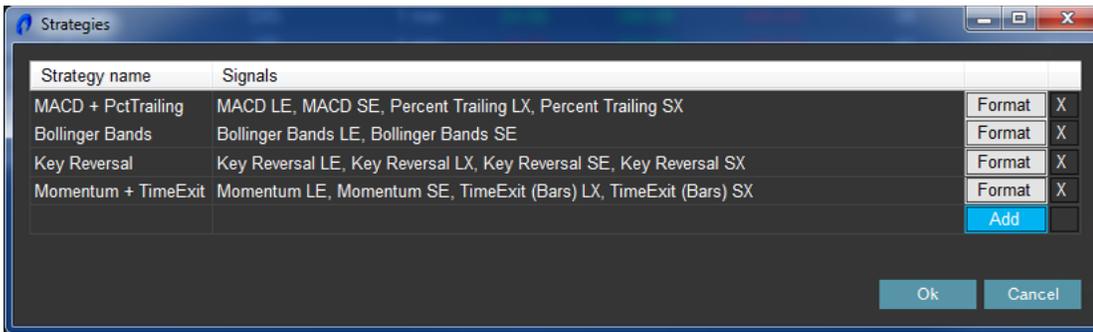
## Related Topics

[StrategyHound – Symbols](#)

[StrategyHound – Strategies](#)

[StrategyHound – Settings](#)

# STRATEGIES



The Strategies dialog lets you specify a set of strategies that are to be tested for each symbol and interval in a StrategyHound optimization.

► Access using the **Strategies** button in the [StrategyHound](#) window.

**Add** – Click to create a new strategy row. Opens the Add Strategy dialog.

## Add Strategy Dialog

- **Select strategy components** – Check each strategy component that you want to include in your strategy. **Note:** A valid strategy must have at least one entry and one exit component.
- **Enter strategy name** – Use the keyboard and type the name you want to use for this strategy. You must enter a name to save the strategy.
- Click **Save** to add the strategy or **Cancel** to exit without changes.

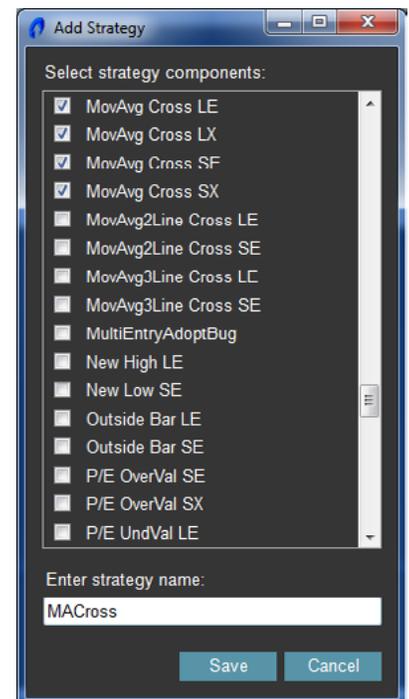
**Strategy name** – This column shows the strategy name for each row.

**Signals** – This column shows the strategy components (signals) that are included in the strategy.

**Format** – Click this button to change the signal settings for a named strategy row. Opens the [Signals](#) dialog.

⊗ Click to remove a symbol from the symbol collection.

► Click **OK** to apply changes or **Cancel** to exit without changes.



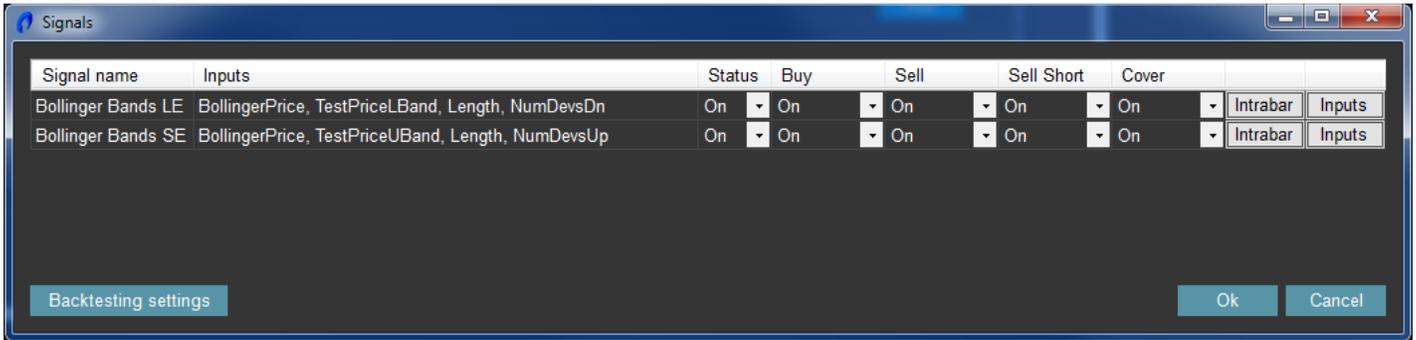
## Related Topics

[StrategyHound – Symbols](#)

[StrategyHound – Intervals](#)

[StrategyHound – Settings](#)

# SIGNALS



The Signals dialog in [StrategyHound](#) allows you to format the parameters for each strategy component (signal) in a named strategy.

► Access using the **Format** button in any strategy row in StrategyHound [Strategies](#) dialog.

**Signal name** – This column shows the name of the signal (strategy component) in each row.

**Inputs** (column) – This column lists the inputs available for each signal row.

**Status** – Click ▼ to set the active status to On or Off for the selected signal.

**Buy** – Click ▼ to select the On, Off or Exit Only status for all buy orders in the selected signal. Exit Only will close a short position but not enter a new long position.

**Sell** – Click ▼ to select the On or Off status for all sell orders in the selected signal.

**Sell Short** – Click ▼ to select the On, Off or Exit Only status for all sell short orders in the selected signal. Exit Only will close a long position but not enter a new short position.

**Buy to Cover** – Click ▼ to select the On or Off status for all buy to cover orders in the selected signal.

**Intrabar** – Click to use the Intrabar Order Generation dialog to change the settings for the selected signal.

**Inputs** (button) – Click to change the optimization values used by the inputs of the selected signal.

**Backtesting Settings** – Click this button and use the Backtesting Settings dialog to change the general and fill assumptions settings for all signals in the current strategy.

► Click **OK** to save the selected symbols or **Cancel** to exit without changes.

## Related Topics

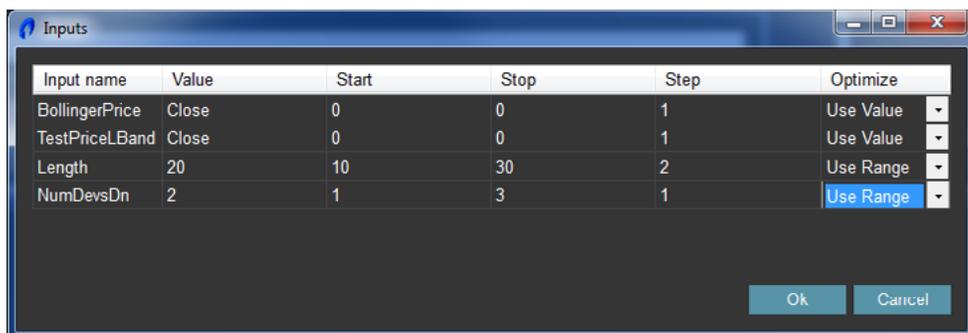
[StrategyHound – Strategies](#)

[StrategyHound – Signals](#)

[StrategyHound – Intrabar](#)

[StrategyHound – Backtesting Settings](#)

# INPUTS



The Inputs dialog in [StrategyHound](#) allows you to select the optimization criteria for each input in a signal.

► Access using the Inputs button in any signal row in the StrategyHound [Signals](#) dialog.

The following column definitions apply to the displayed input rows. Input name – The name of the signal (strategy component).

**Value** – The price or numeric value associated with the input. Used when Optimize → Use Value is selected.

**Start** – The first value to use when Optimize → Use Range is selected.

**Stop** – The last value to use when Optimize → Use Range is selected.

**Step** – The increment added to the each previous value when Optimize → Use Range is selected.

**Optimize** – Click ▼ to choose the method used for input optimization:

- Select Use Value to apply the item in the Value column as the input value.
- Select Use Range to apply values from Start to Stop, incremented by Step, as the input value.

► Click **OK** to save the selected settings or **Cancel** to exit without changes.

## Related Topics

[StrategyHound – Symbols](#)

[StrategyHound – Intraday](#)

[StrategyHound – Backtesting Settings](#)

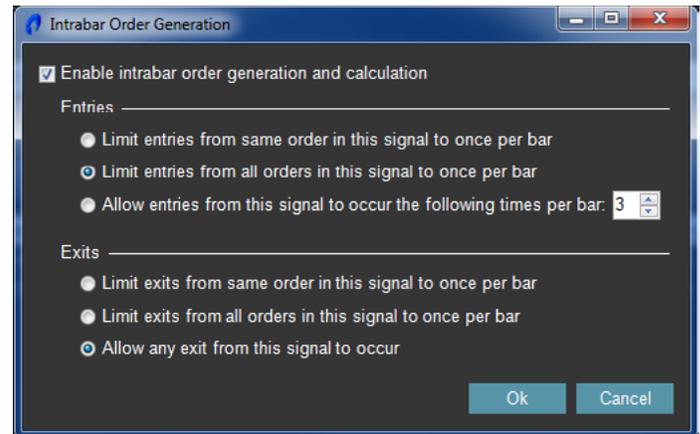
[StrategyHound – Strategies](#)

# INTRABAR ORDER GENERATION

The Intrabar Order Generation dialog in [StrategyHound](#) allows you to enable intrabar order generation for each signal and to specify entry/exit limits if desired. For more information, see About Intrabar Order Generation in the TradeStation Platform Help.

 The Enable intrabar order generation and calculation option cannot be enabled using Kagi, Kase, Line Break, Momentum, Point & Figure, Range, or Renko charts.

► Access using the **Intrabar** button in any signal row in the StrategyHound [Signals](#) dialog.



Enable intrabar order generation and calculation – Check this setting to allow a signal to generate orders within a bar interval for entries and exits (as specified below). If this check box is not checked, orders are generated at the Close of a bar.

## Entries

Contains the setting that determines how entries are calculated for the selected signal when intrabar order generation is enabled:

- Limit entries from same order in this signal to once per bar – Specifies that an entry order from the same signal can only be filled one time per bar (even if the backtesting Position Limits setting has pyramiding enabled).
- Limit entries from all orders in this signal to once per bar (Entry default) – Specifies that signal orders may only enter once per bar.
- Allow entries from this signal to occur the following times per bar: [ number ] – Indicates that you may enter from this signal up to the specified number of times per bar.

## Exits

Contains the setting that determines how exits are calculated for the selected signal when intrabar order generation is enabled:

- Limit exits from same order in this signal to once per bar – Specifies that an exit order from the same signal can only be filled one time per bar (even if the backtesting Position Limits setting has pyramiding enabled).
- Limit exits from all orders in this signal to once per bar – Specifies that signal orders may only exit once per bar.
- Allow any exit from this signal to occur (Exit default) – Specifies that you may exit from this signal any number of times per bar as conditions dictate.

► Click **OK** to save the selected settings or **Cancel** to exit without changes.

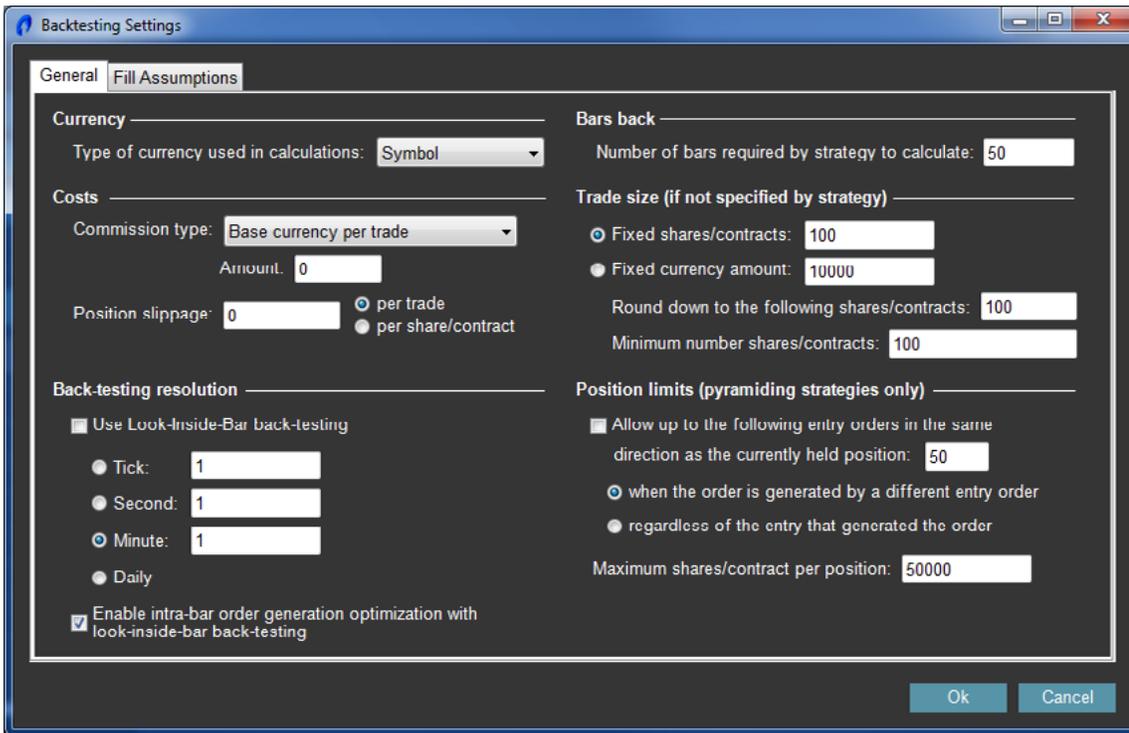
## Related Topics

[StrategyHound – Signals](#)

[StrategyHound – Inputs](#)

[StrategyHound – Strategies](#)

# BACKTESTING SETTINGS



## General

The General tab on the StrategyHound – Backtesting Settings dialog allows you to set or modify backtesting preferences for the all of the signals in a named strategy. This includes specifying trade costs, setting backtesting parameters, modifying the trade size for strategies (if not specified by the strategy) and determining limits on positions for pyramiding strategies.

► Access using the **Backtesting Settings** button in the [Signals](#) dialog and clicking the General tab.

## Currency

Displays the currency type for the selected strategy to be either the currency of the symbol or of your brokerage account.

- Type of currency used in calculations: [ currency ] – Select the currency type to use for all signals in a named strategy.

## Costs

Contains the commission and slippage in currency amounts.

- Commission type: [ commission ] – Select type of commission payment you wish to use and the associated Amount.
- Position slippage: [ amount ] and [ type ] – Enter the currency amount and select the appropriate type that you anticipate as slippage.

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## Backtesting Resolution

The Look-Inside-Bar-Backtesting has no effect on real-time data or strategy automation as it is a feature of TradeStation's strategy backtesting feature. It is designed to report more accurate backtesting results, and allows a strategy to examine a finer data interval than appears in a bar interval so as to more carefully reconstruct the historical trades as they might have occurred in real time.

It is not necessary to use Intraday Order Generation to take advantage of the improved backtest accuracy afforded by Look-Inside-Bar Backtesting. If checked, the backtesting resolution is automatically selected based on the type of interval being used.

 For more information, see About Intraday Order Generation.

- **Use Look-Inside-Bar Backtesting** – Check this setting to enable the use of a sub-interval to identify price action occurring within each bar interval.
- **Tick** – Select this setting and enter the number of ticks to identify price action occurring at the tick level within a bar interval.
- **Second** – Select this setting and enter the number of seconds for each sub-interval used for backtesting.
- **Minute** – Select this setting and enter the number of minutes for each sub-interval used for backtesting.
- **Daily** – Select this setting to use the backtesting feature for weekly and/or monthly charts.
- **Enable intra-bar order generation optimization with look-inside-bar back-testing** – Check this setting to include intra-bar order generation as part of the back-test optimization.

## Bars Back

- **Number of bars required by strategy to calculate [ bars ]** – Enter the minimum number of bars that the strategy backtest needs to calculate.

## Trade Size *(if not specified by strategy)*

Contains the default trade size setting for your strategy if not included in the strategy itself.

- **Fixed shares/contracts** – Check this setting to enter the number of shares or contracts.
- **Fixed currency amount** – Check this setting to enter the currency amount for each trade.
- **Round down to the following shares/contracts** – Enter the number of shares or contracts you want to use for rounding off the trade size.
- **Minimum number shares/contracts** – Enter the minimum number of shares or contracts for your trade size.

## Position Limits *(pyramiding strategies only)*

Contains the settings for multiple order pyramiding for the listed signals. When unchecked, only one entry order in the same direction is allowed per strategy.

- **Allow up to the following entry orders in the same direction as the currently held position [ number ]** – Check this setting and enter the number of additional shares or contracts to allow for existing positions within a market.
- **When the order is generated by a different entry order** – Select this setting to ignore all buy or sell orders generated by the entry that initiated the current open position.

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- **Regardless of the entry that generated the order** – Select this setting to consider all buy or sell opportunities regardless of whether they come from the same entry signal or not.
- **Maximum shares/contracts per position [ number ]** – Enter the maximum number of shares or contracts to use for each position.

▶ Click **OK** to apply changes or **Cancel** to exit without changes.

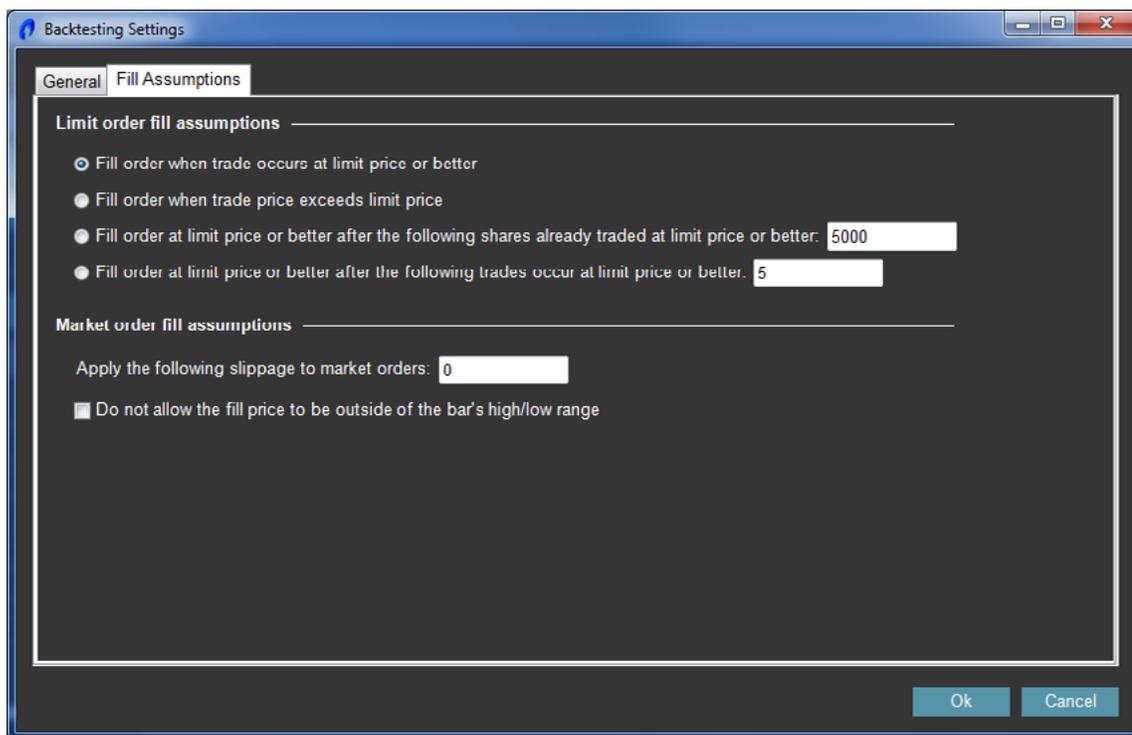
## Related Topics

[StrategyHound – Backtesting – Fill Assumptions](#)

[StrategyHound – Signals](#)

[StrategyHound – Strategies](#)

# BACKTESTING SETTINGS



## Fill Assumptions

The Fill Assumptions tab on the StrategyHound – Backtesting Settings dialog allows you to set or modify limit and market order preferences for the all of the signals in a named strategy.

► Access using the **Backtesting Settings** button in the [Signals](#) dialog and clicking the Fill Assumptions tab.

## Limit Order Fill Assumptions

Contains the limit order fill settings for all signals in a named strategy.

- **Fill order when trade occurs at limit price or better** – Fills historical orders as soon as the limit price or better has been reached.
- **Fill order when trade price exceeds limit price** – Specifies that when the trade price exceeds the limit price, the order should be assumed to be filled.
- **Fill order at limit price or better after the following shares already traded at limit price or better:** [ number ] – Select this setting to enter the number of shares or contracts (trade volume) that must be traded at your limit price or better before assuming a fill. This setting is available when Trade Volume is selected under ‘Volume Type’ using [Format interval](#) on an interval row.
- **Fill order at limit price or better after the following trades occur at limit price or better:** [ trades ] – Select this setting to enter the number of trades (ticks) that must occur at your limit price of better before assuming a fill. This setting is available when Trade Count is selected under ‘Volume Type’ using [Format interval](#) on an interval row.

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## Market Order Fill Assumptions

Contains the market order settings for all signals in a named strategy.

- **Apply the following slippage to market orders:** [ amount ] – Enter the slippage amount to be applied to your market orders.
- **Do not allow the fill price to be outside of the bar's high/low range** – When checked, prevents the fill price from moving outside the high/low range of each interval.

▶ Click **OK** to apply changes or **Cancel** to exit without changes.

## Related Topics

[StrategyHound – Backtesting – General](#)

[StrategyHound – Signals](#)

[StrategyHound – Strategies](#)

# SETTINGS

The Optimization Settings dialog consists of items used to modify the parameters of a StrategyHound optimization.

► Access using the Settings button in the [StrategyHound](#) window.

## Optimization Method

**Method type** – Selects the optimization method and properties.

- **Exhaustive** – Select Exhaustive for a comprehensive method that calculates all possible combinations of all strategy input parameters within the range specified. Since all parameter combinations are calculated, the exhaustive method guarantees that the algorithm finds the optimal set of strategy parameters of those compared.
- **Genetic** – Select Genetic for an optimization method based on an evolutionary algorithm. Genetic optimizations are preferable when the number of tests in the exhaustive method might be too time consuming or processing intensive. Running optimizations in shorter times will also allow you to select wider range of parameters in your strategy optimizations. Genetic optimizations do not calculate all possible strategy parameter combinations but will use an algorithm based on natural selection that will arrive to an answer that is statistically significant.

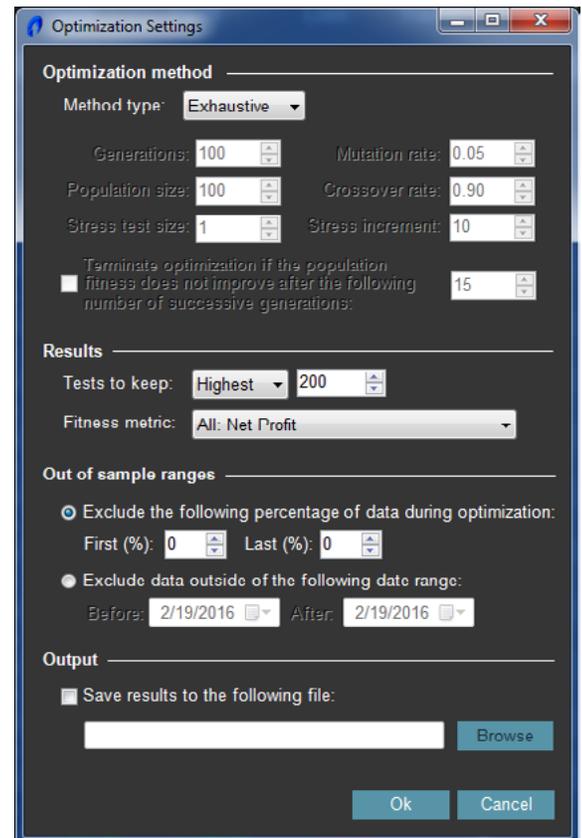
## Additional Genetic Optimization Settings

Allows you to customize the parameters of the genetic optimization engine when you select the Genetic method type.

 Unless you have a good understanding of genetic algorithms, it is recommended that you only modify the Stress Test size and Stress Increment fields. Stress testing is a localized robust search around each individual parameter set within a genetic search and is only available when the Genetic Optimization method is used.

- **Generations** – The number of iterations that the genetic algorithm will run until it arrives at the strongest population.
- **Population size** – The number of chromosomes that will be subject to the genetic selection process. After the specified generations, the outstanding population group is understood as being of improved fitness due to the natural selection of the genetic algorithm.
- **Stress test size** – The number (size) which defines the number of different parameter sets included with each stress test. If the Stress test size is one, then stress testing is turned off, since no additional testing will be performed relative to the base parameter set. If you want to perform stress testing, the recommended setting is 3.

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- **Mutation rate** – The random rate of modification of the genes in chromosomes after each generation. Mutation is used to find new chromosomes to replace the “weak” ones.
- **Crossover rate** – The rate that specifies how close the replacement genes in chromosomes are picked after each generation. Crossover is used to find new chromosomes to replace the “weak” ones.
- **Stress increment** – The percentage that the parameters will be stressed either upwards or downwards.
- **Terminate optimization if the population fitness does not improve after the following number of successive generations [ number ]** – Check this setting for the genetic optimizer to automatically terminate if the population fitness did not improve for the specified number of generation. If no improvement took place for 15 (default) or more generations, the algorithm has converged and optimization is not necessary.



For more information, see Genetic Optimization in the TradeStation Platform Help.

## Results

Contains the default settings to use for the Optimization Results.

- **Tests to keep [Highest/Lowest] [ number ]** – Select the desired setting (highest or lowest) from the drop-down list and enter the number of tests that you want to be displayed in the Optimization Results when optimizing a strategy.
- **Fitness metric** – Select the desired fitness function from the drop-down list, which will be used as the optimization test criteria for strategy optimizations. The criteria are used to identify the best permutations and rank the best results for an optimized strategy, which is based on net profit for all trades (by default). The fitness function selected is used for the next and all successive times you run an optimization. For more information, see Strategy Optimization Report Fitness Function Fields in the TradeStation Platform Help.

## Out-of-Sample Ranges

Specifies the data that should not appear in the results. It is suggested that you do not exclude less than 30% of the data and no more than 50% of the data during the Exhaustive/Genetic optimization.

- Exclude the following percentage of data during optimization:
  - First [ ] % and Last [ ] %** – Select this setting to exclude the first and/or last percentage of data. Enter the percentage amounts in the First and Last boxes to be excluded from optimization. By default, a setting of 0% for both values will optimize on all data.
- Exclude data outside of the following date range:
  - Before [ ] After [ ]** – Select this setting to exclude data before and after the entered dates. Click the down arrow to select the desired dates from the drop-down calendar.

## Output

**Save results to the following file [location]** – Check this setting to enter the location of a file to which you want to save the optimization results you generate. Click Browse to navigate to the desired location.

► Click **OK** to apply changes or **Cancel** to exit without changes.

## Related Topics

[StrategyHound – Symbols](#)

[StrategyHound – Intervals](#)

[StrategyHound – Strategies](#)

# INDEX

## F

**Fitness metric 17**

## S

### StrategyHound

About StrategyHound **2**

Backtesting – Fill Assumptions **14**

Backtesting – General Settings **11**

Inputs **9**

Intervals **6**

Intrabar Order Generation **10**

Settings **16**

Signals **8**

Strategies **7**

Symbols **5**

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