



Omnesys Technologies



NEST Strategy Script 2L3L Bidding Strategy

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REVIEW NOTES	
VERSION NOTES 2.0.0.1	This document explains the 2L3L Bidding strategy functionality in BFO Segment.
KEYWORDS	

Proprietary Notice

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2L3L Bidding Strategy (BFO):

This strategy allows the user to do a 2L or 3L trading in futures and/or options. One can do trading in any combination of futures and/or options in BFO Segment.

Nest Strategy Client:

Portfolio Tree: Each portfolio comprises of 2 tokens for 2L and 3 tokens for 3L.

Input Parameters:

Portfolio Name: The name of the portfolio.

Exchange: The relevant exchange segment needs to be populated, in this case, BFO

Spread Type: 2L or 3L.

Symbol: User needs to select the relevant symbol

Pro/Cli : It gives user an option to do in PRO or in CLI. When cli is selected will give an option to select Account id and Participant id.

Calculation Method:

a. Spread: This method can be used with both 2L as well as 3L spread type. Calculation for various type of combination for spread Calculation method is given below:

All BUY Tokens:

$$\text{Calculated Spread} = \sum_{i=1}^n \text{Weighted Avg. Buy Token}(i) * \text{Ratio}(i)$$

Where n= number of buy tokens

All SELL Tokens:

$$\text{Calculated Spread} = \sum_{i=1}^n \text{Weighted Avg. Sell Token}(i) * \text{Ratio}(i)$$

Where n= number of sell tokens

Combination of BUY & SELL Tokens

$$\text{Calc. Diff} = \sum_{i=1}^n \text{Wtd Avg. Sell Token}(i) * \text{Ratio}(i) - \sum_{j=1}^m \text{Wtd Avg. Buy Token}(j) * \text{Ratio}(j)$$

Where **n**= number of sell tokens and **m**= number of buy tokens

b. **Buy/Sell:** This method is applicable for 2L spread type only.

$$\text{Calc. Ratio} = (\text{Weighted Avg. Buy token}) / (\text{Weighted Avg. Sell token})$$

c. **Sell/Buy:** This method is applicable for 2L spread type only.

$$\text{Calc. Ratio} = (\text{Weighted Avg. Sell token}) / (\text{Weighted Avg. Buy token})$$

Limit: The calculated Execution value is compared with the rate (limit) set by the user and decision is taken whether to place an order or not accordingly.

Quote Threshold: The order is placed only when the market spread is more than or equal to Quote threshold in case when calculated method selected is Spread. The idea is to start bidding when the Quote threshold is breached. It is only applicable both during placement as well as modification of orders.

Market Protection Type: is useful to prevent user from manual/typing errors. It has three options:

1. In Percentage: is useful to prevent user from manual/typing errors. For example, let's say user has entered a limit as 6, and has entered market protection as 30% and the calculated market difference comes out to be 10, the system will not allow the orders to be executed (placed) below Rs. 7. Similarly, if the calculated market rate comes out to be -10, and user has entered market protection as 30%, and entered limit as -14, then the system will not allow the orders to be executed (placed) below Rs. -13. In other words, it will prevent the user from the downside risk by as much as 30% during the initial placement of orders.

2. Absolute: The orders will not be generated if the set limit is beyond the market protection limit. Based on the value entered, it will create a band of Current difference +/- Market protection limit. If the set limit is beyond this band it will not allow any orders to be placed.

3. No (Market Protection): If this option is selected, then the Market protection will not be considered before placing the orders.

Market Protection: This is where the value needs to be entered for market protection after selecting market protection type. If market protection type is selected as no, this parameter field will be disabled. In order to apply the market protection, one needs to calculate the current market rate to compare with the limit specified by the user.

Threshold Qty (%): It is used to check whether a mentioned percentage of the order lots is available for the second leg in the case of 2L spread type and second leg & third leg in the case of 3L spread type for the specified market Depth. For example, if order lot for the second and third leg is 6 & 8 lots respectively with market depth as 3 and threshold qty % as 50%, then the system will check whether 3 lots for second leg (50% * 6lots) and 4 lots for the third leg (50% * 8) is available in the first three depths. If it is available then only it will place/bid for the first leg. If the specified threshold quantity is not available in either or both legs for the specified depth, no first leg orders will be placed. Even during modification of first leg, quantity checks are done for the remaining legs. If any time during the

modification, if the quantity becomes unavailable for any leg, the existing first leg open order will be cancelled.

Market Depth: The threshold qty % will be checked for the second leg in the case of 2L spread type and second leg & third leg in the case of 3L spread type for the specified market depth. It specifies till how much depth once must check for the quantity. It should be noted that although depth is 5, but if the quantity is available at lower depth (say 3rd depth) itself, it will take weighted average accordingly and then calculate the first leg price. In other words, the strategy will not calculate the weighted average price for the particular leg till the depth specified, but will calculate the weighted average price based on the quantity available and price at which it is available.

First Leg Type: This parameter is useful in determining how the first leg (bidding leg) will be placed in the market. It has two options:

- a. **Best Bid/Ask:** If user selects Best Bid/Ask, then the strategy will place a single limit day order for the first leg. For placing first leg, our system will calculate the first leg price based on the limit and the price of the second leg in case of 2L and second and third leg in case of 3L. If the user is buying the first leg and the calculated first leg price is greater than the first leg touchline price, it will modify the current bid rate by one tick size to become best buyer (bid rate + 1 tick size). If calculated first leg price is less than the first leg touchline price, it will stand at that price and will not bid to become best buyer. Similarly, if the user is selling first leg and calculated first leg price is less than the first leg touchline price, it will modify the current first leg price (ask rate) by one tick size to become best seller (ask rate – 1 tick size). If calculated first leg price is more than the first leg touchline price, it will stand at that price and will not bid to become best seller.

It should be noted that bidding to become best buyer and best seller will continue till the calculated (derived) first leg price. So calculated first leg price becomes a floor/ceiling for bidding.

- b. **Sweep/Stand Price:** If user selects Sweep/Stand Price, then the strategy will place a single limit day order at a price calculated based on the limit specified and the price of the second leg in case of 2L and second and third leg in case of 3L. For placing first leg, our system will calculate the first leg price and place the order in the market at the calculated price but **will not** become best buyer or seller. First leg price will be modified based on the changes in the prices of second leg (in case of 2L) and second and/or third leg in case of 3L.

Second/Third Leg Type: This parameter is exclusively for the second leg. Once the first leg gets completed, how should the second leg be placed depends on this parameter. It has four options to place the second leg and is mentioned below:

1. **LTP Based MPP%:** Once the first leg is completed, second leg and third leg (in case of 3L) are placed based on the LTP +/- MPP%. In other words, let say, user is selling first leg, and second leg is the buy order, it will take the LTP of that scrip add x% specified in the MPP% parameter and then place the order. If for any reason it is not completed, and there is a change in LTP, it will change the order accordingly. Similarly, let say, user is buying first leg, and second leg is the sell order, it will take the LTP of that scrip subtract x% specified in the MPP% parameter and then place

the order. If for any reason it is not completed, and there is a change in LTP, it will change the order accordingly. For any reason, if this option is selected, and user stops the strategy, the pending second leg order in case of 2L and the pending second and third leg order in case of 3L will be canceled.

2. **Same:** Once the first leg is completed, second leg for 2L and second & third leg for 3L is placed as limit orders with the Same rate. For example, if one is buying, then bid rate will be taken as price for limit order and if one is selling then ask rate will be taken as price for the limit order.
3. **Placed:** Once the first leg is completed, second leg for 2L and second & third leg for 3L is placed as a limit order at the price that was used to calculate the first leg price.
4. **Opposite:** Once the first leg is completed, second leg for 2L and second & third leg for 3L is placed as limit orders with the Opposite rate. For example, if one is buying, then ask rate will be taken as price for limit order and if one is selling, then bid rate will be taken as price for the limit order.

Timer: This is exclusively for second leg for 2L and second & third leg for 3L. If the Leg type for the second leg for 2L and second & third leg for 3L is selected as Opposite, Same, or Placed, the timer will become applicable. After timer expiration, any open orders for second or third leg will be converted to limit order based on LTP Based MPP%. Timer starts as soon as the second and/or third leg is placed by system.

Tick Mod (Rs): is considered for bidding and is used to decrease the number of modifications. If the difference between current order price and new bidding price is greater than or equal to the Tick Mod then only order is modified with the new bidding price. It is applicable for first leg only.

Tick Size (Rs.): It is a minimum tick for that selected scrip token in a particular exchange.

Following parameters user needs to enter for each leg:

Instrument Type: User needs to select the relevant instrument type (futures or options) for the selected exchange and for the selected symbol. This needs to be entered for each leg.

Expiry Date: User needs to select the relevant expiry date for the selected options (or futures). This needs to be entered for each leg.

Buy/Sell: User needs to select whether to buy or sell the relevant token. This needs to be entered for each leg.

Opt Type: User needs to select the relevant option type (CALL or PUT), if option token is selected in instrument type.

Strike Price: User needs to select the relevant strike for the options selected. If futures is selected, the field is automatically disabled. This needs to be entered for each leg.

MPP%: This parameter is provided for both second leg as well as third leg separately. It applicable only when Second leg type selected **is LTP Based MPP%**.

For Second/Third Leg **Buy** Orders:

$$\text{Placed Second/Third Leg Buy Price} = \text{LTP} + (\text{LTP} * \text{MPP}\%)$$

For Second/Third Leg **Sell** Orders:

$$\text{Placed Second/Third Leg Sell Price} = \text{LTP} - (\text{LTP} * \text{MPP}\%)$$

The range that can be entered in this field is **0.01%** to **3%**.

Ratio: This is only used when the calculation type is **spread**. This needs to be entered for each leg.

Order Lot: This is the quantity (in lots) to be placed per opportunity and can be multiple lots. This needs to be entered for each leg.

Total Lot: This is the total trade quantity (in lots) that the user intends to trade. This needs to be entered for each leg.

The above parameters need to be updated from the front-end. Once the parameters are updated, the user needs to start the Nest Strategy from the front end so that the Nest Strategy engine starts running at backend.

Nest Strategy Engine:

The execution of the script happens in the Nest Strategy engine running at backend.

Execution:

The Calculated price is compared with User Set limit. It will check whether the user set limit is within market protection, depending on the type of market protection selected. Before placing any order for the first leg, it will check whether the quantity is available for other legs (second leg for 2L, and second & third leg for 3L). It will only place order when the quote threshold condition is breached.

In this strategy, user has an option to select all buys or all sells or a combination of buys and sells.

2L-3L Working:

1. As soon as user enters the parameters in the front-end, the strategy will calculate the current market spread/ratio based on the ratio entered by the user and the market price of each leg in the selected exchange.
2. Depending on the first leg type, the strategy will place the first leg order subject to market protection and other conditions such as threshold quantity percentage and quote threshold conditions being satisfied.
3. As soon as the first leg gets hit, the remaining legs are placed in the market depending

on the Second order type. If the second order type is other than 'LTP Based MPP%' option, timer will be enabled. After expiration of timer, any pending order for remaining legs will be placed as limit order based on LTP Based MPP%. Any open second leg/third leg order will get cancelled, when the strategy is stopped.

4. In case of partial completion of first leg, remaining first leg open orders are cancelled. After cancel confirmation second and third legs will be placed.
5. The system will stop placing first leg order, if the quantity specified in the order lot for either leg is unavailable at any given point in time.
6. When all orders are buy orders or when all legs are sell orders, the value entered in the set limit field can only be **positive**, while when combination of both buy orders and sell orders is used, the set limit field can be either **positive** or **negative**.
7. When Second leg type is selected as LTP Based MPP%, and the first leg is placed and completed, the second leg/third leg is placed based on the LTP Based MPP%. For second/third leg buy order, it will add MPP% to the LTP and place it and for second/third leg sell order, it will subtract MPP% to the LTP and place the limit order accordingly. If for any reason, the orders are still open and LTP changes, the placed price will be modified accordingly.

Front-End Snapshot:

The screenshot displays the '2131 Bidding-4.1.2.1 VENU' window. It contains several sections for order configuration:

- Portfolio/Account Details:** Portfolio (test2), Exchange (BFO), Spread Type (2L), Symbol (BKXOPT), Pro cli (CLI), A/C ID (0002), Part ID, Calc Method (Spread), and Depth (5).
- Order Parameters:** Limit (Rs) (2.25), QuoteThresh (-1.25), Mkt.Ptn.Type (Percentage), Mkt. Prot Thres.Qty(%) (30, 100), First Leg Type (Best Bid/Ask), Second/Third LegType (LTPBasedMPP%), Time(Sec), TickSize (0.25), and TickMod (0.25).
- 2L/3L Scrip Details Table:**

Inst. Type	Expiry Date	Buy/Sell	Opt.Type	Strike Price	MPP(%)	Ratio	Order Lot	Total Lot	Trade Lots
IO	10Jan201	BUY	CE	13000.00		1	1	1	0
IO	10Jan201	BUY	CE	13200.00	0.05	1	1	1	0
- Buttons:** Save and Cancel.

Risk Management

Risk Management System can be configured to have following checks before the orders are released to the exchange. The checks which are defined by exchange with respect to Algorithms are in place in the system. Below mention rules can be configured in the system to control the risk parameter which is defined by exchange.

Sr.No.	Checks	Rules to set	Remarks
1	Price Check	Check Price Range Based on LTP Check Circuit Limit	This rules will create a price range on the basis of Last Traded Priced as per the percentage set in the category window.
2	Quantity Check	Order Quantity including Square off Order Board Lot Quantity including Square off Order	This rules will restrict per order the number of quantity to be placed in market which is defined the category window. The user can define the number of quantity in Weights and in lots for Futures.
3	Order Value Check	Order Value including Square off Order	This rule will restrict per order the order value which can be placed in the market which is defined in category window
4	Trade Price Protection Check	Check Circuit Limit including square off order	This rule does not allow to place the order which has been placed above the Higher Circuit Limit or Lower circuit limit which id defined for contract/scrip by exchange
5	Market Price Protection	Check Price Range Based on LTP	This rule will create a price range on the basis of Last Traded Priced as per the percentage set in the category window.
6	Cumulative Open Order Value check	Pending order value	This rule will restrict the Open Order with the Value set in the category
7	Automated Execution Check	Turnover Order Level and Turnover Order Level Limit	This rule will calculate the value of all executed/ Unexecuted and un confirm orders and if breach the value set in category then further order will get rejected
8	Automatic stoppage in event of Algo execution leading to a loop or a runaway situation.	Order Throttle	If there number of order per seconds breaches the value which is set in Throttle then further order gets rejected by the system.
9	Net Position Vs. available margin	Gross Exposure, Gross Exposure Derivative, Var	User can set the risk parameter based on Exposure and Margin based on which the margin used will be

		Margin Order Level, Span Margin Order Level	calculated on the basis of position taken. If the Margin used is equal to Cash margin then further order will be rejected by the system
10	RBI Violation checks for FII Restricted stocks.	Restricted Basket or RMS Blocking	User need to create a Restricted basket for the scrip and assign to the category of the user / client. Also RMS blocking can be used.
11	MWPL violation check	RMS Ban Symbol or RMS Blocking	The scrip for which market wide position limit is breach then scrip can be blocked or it needs to be in Ban.
12	Position Limit Checks	Scrip Group / Scrip Margin	User can define the quantity scrip wise in which the position can be taken in scrip group and then it needs to be assign to category at client level
13	Trading Limit Checks	Scrip Group / Scrip Margin	User can define the quantity scrip wise in which the position can be taken in scrip group and then it needs to be assign to category at branch level
14	Exposure Limit check at individual client level and at overall level	Gross Exposure and Gross Exposure Limit	User can define the Exposure at Branch Level as well as Broker Level
15	Number of orders for the logic	NA	Depends on the user parameter (i.e order qty) set. This can vary from a minimum of a single lot to a maximum of total qty set.
16	Maximum number of scrips / contracts in which the logic will work at a time	NA	At a time, maximum number of scrips/contracts in which logic will work at a time is 1 or 2.
17	Number of legs		Two