To Daiwa Securities Capital Markets
Algorithmic Trading Suites

Sniper Specifications

Confidential

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Simplex Technology, Inc.

【Contents】

1. Sniper Algorithm

1.1 Overview

Sniper algorithm is aggressive stealth strategy. Sniper hits the far side quotes up to specified limit price without showing size. Also at your option, display specified quantities.

2. Algorithm Parameters

The Sniper algorithm defines the following parameters.
The Sniper of TargetStrategy#6061(847 for Bloomberg EMSX) is 20. Price#44 is required.

No	Parameter name	Description	Required	Parametric in FIX	Amendable	Default value
1	Start Time	Order Start Time (HH:MM)	×	#168	○	—
2	End Time	Order End Time (HH:MM)	×	#126	○	—
3	DisplayQty	The quantity to be displayed. (Order Qty >= Display Qty, 0～1,000,000,000 Integer)	×	#6075	○	*2
4	DisplayQty AdjustRate	Parameter use to find out the Max/Min Execution Qty from the Display Qty. (0～99 Integer)	×	#6076	○	10% *3
5	Auto Cancel	Flag to automatically cancel (If checkbox is on, auto cancel)	○	-	×	ON
6	Order Exclude Point	Order exclusion point(min) (1～60 Integer)	○	-	×	0
7	Style	Parameter to set limit price and speed to slice out the child order. Valid range of value is 1 to 9. It will slice out faster if the value is higher. Mapping of the Style parameter from Client order from FIX and the value of this parameter is: Passive:3 Normal:5 Aggressive:7 Style determines the refill timing and amending price type for Display order. Refer to [3.5 Applying Execution Ratio by Style]. [3.6 Amending price type for display order]	×	#6065	○	Aggressive:7
8	AutoDisplay	Y/N	×	6077	○	N
9	TriggerQty	1～1,000,000,000 Integer Set by Shares.Refer to [3.4Logic to Calculate TriggerQty / DontTakeQty]	×	6078	○	1

10	TriggerLots	1～1,000,000,000 Integer Set by lot.	×	－	○	－
11	DontTakeQty	0～1,000,000,000 Integer Set by Shares.	×	6079	○	0
12	DontTakeLots	0～1,000,000,000 Integer Set by lot.	×	－	○	－
13	DelayTime	0～100,000 Integer(milli sec) <Aggressive> Delay slice out of snipe order. <Normal / Passive> Delay slice out of snipe order. Delay slice out of display order.	×	－	×	150

*1 SS is not supported.

*2 if AutoDisplay=Y, use "average trade size", otherwise no pegging

*3 Refer to [7.] Set Up Parameter for detail.

3. Slice / Amend Specifications

3.1 Specification of Snipe orders and Display orders

[Snipe order]
The snipe order is sented as IOC.

Continuous Session	Slice out	Limit Price	<Aggressive/ Normal > Limit price of Parent Order. < Passive> On far side
		Timing	・ First Time <Aggressive/ Normal > Slice out immediately, if all visible quantity within limit price >= TriggerQty. < Passive> Slice out immediately, if quantity on far side >= TriggerQty. ・ Second Time or More <Aggressive/ Normal > Slice out, When quantity on far side >= TriggerQty. < Passive> Slice out, When quantity on far side within limit price >= TriggerQty. This check runs every time changing ・ All visible far side price / size ・ Volume ・ Fill / Partial fill
		Order size	<Aggressive/ Normal > All visible quantity within limit price - DontTakeQty < Passive> far side quantity - DontTakeQty
		Splitting	No splitting
Auction			Nothing
Kehai			Nothing

[Display order]

Continuous Session Kehai	Slice out	Limit Price	<Aggressive> Limit price of Parent Order. <Normal / Passive> On near side If there are not quotes on near side, last price. If there are not last price, base price.
		Timing	<First Time> Slice out immediately after sniping. <Second Time or More> Slice out, when the below condition meeted. Round down(Display qty ± random(Display qty x Display qty adj rate), trading unit) x At Execution Ratio(*1) > Quantity at market This check runs every time receiving exchange feed of fill or partial fill. *1 Able to change which the default value is “20%” by changing the Style

			Refer to [3.2.1.] Adjusting Execution Ratio by Style
		Order size	Round down(Display qty ± random(Display qty x Display qty adj rate), trading unit) - Quantity at market
		Splitting	No splitting
	Amend	Limit Price	<Aggressive> Limit price of Parent Order. <Normal / Passive> On near side If on sniping target snipe qty > unsliced qty, amend limit price. refer to [Behaviour of Display order on Sniping [Normal / Passive]]
		Interval	Real-time
Auction	Slice out	Limit Price	<Aggressive> Limit price. <Normal / Passive> On near side If there are not quotes on near side, last price. If there are not last price, base price.
		Timing	1 min. before market opens
		Order size	Round down(Display qty ± random(Display qty x Display qty adj rate)
		Splitting	No splitting
	Amend	Limit Price	<Aggressive> Limit price of Parent Order. <Normal / Passive> On near side

3.2 Behavior of Display order on Sniping [Normal / Passive]

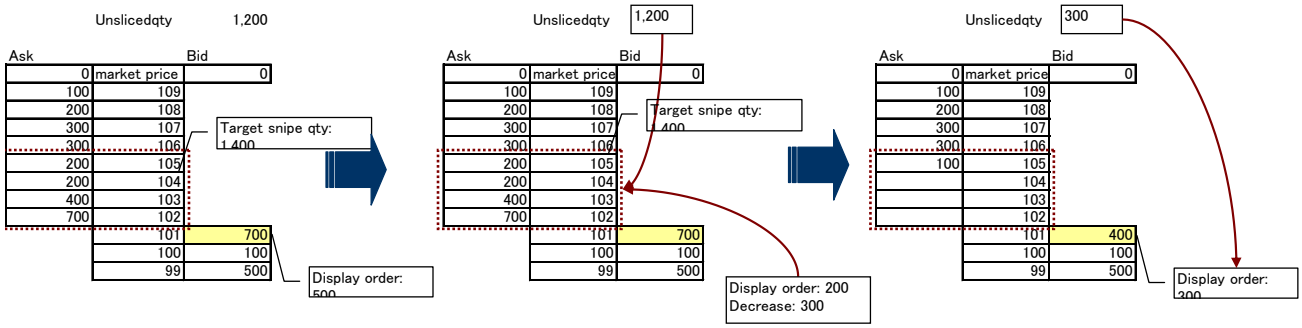
If [Target snipe qty > Unsliced qty] on sniping, behavior of display order is as follows.

If [Target snipe qty > Unsliced qty], the quantity which is short is added from display order.
The steps are as follows.

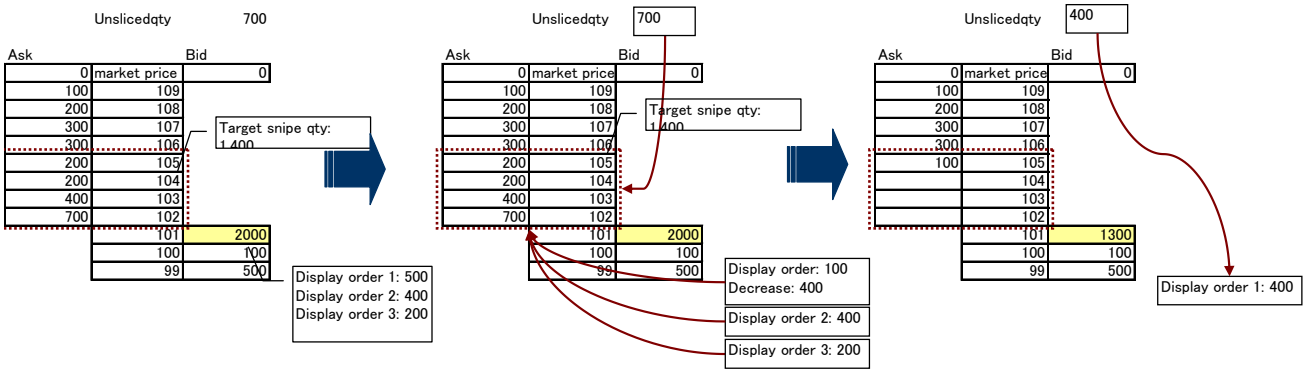
1. Slice out Snipe order (as IOC) from UnslicedQty.
2. Target snipe qty > 0 and Display order qty > 0
   Slice out Snipe order (as IOC) from display order whose execution rate is lower.(*1)
   Repeat step 2 as long as [Target snipe qty > 0 and Display order qty > 0]

*1 If buy, replace order in ascending order of price and descending order of sent time.

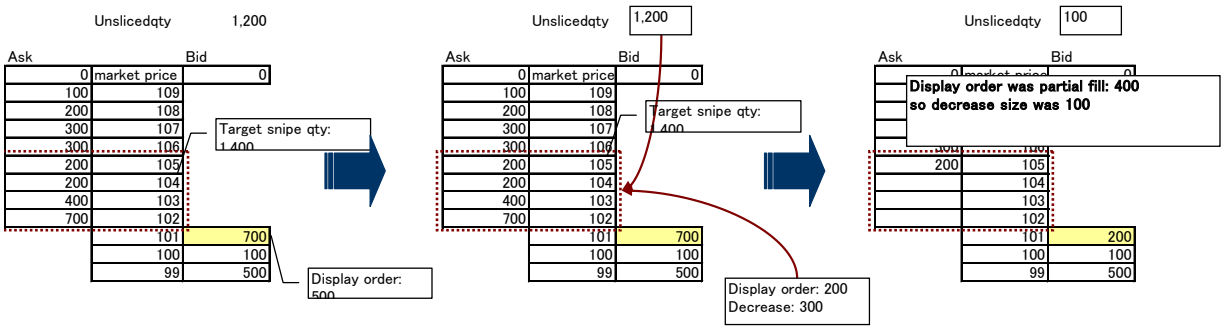
[Condition]
Style: Normal Limit price: 105 Unsliced qty: 1,200 Target snipe qty: 1,400
Target display qty: 500 Display order qty at market: 500 TriggerQty: 200, DontTakeQty: 100

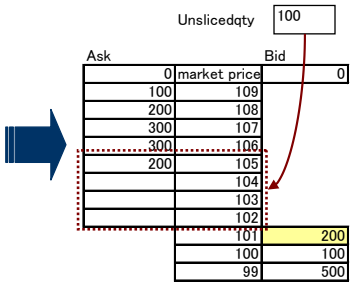


[Condition]
Style: Normal Limit price: 105 Unsliced qty: 700 Target snipe qty: 1,400
Target display qty: 1,100 Display order qty at market: 1,100 TriggerQty: 200, DontTakeQty: 100

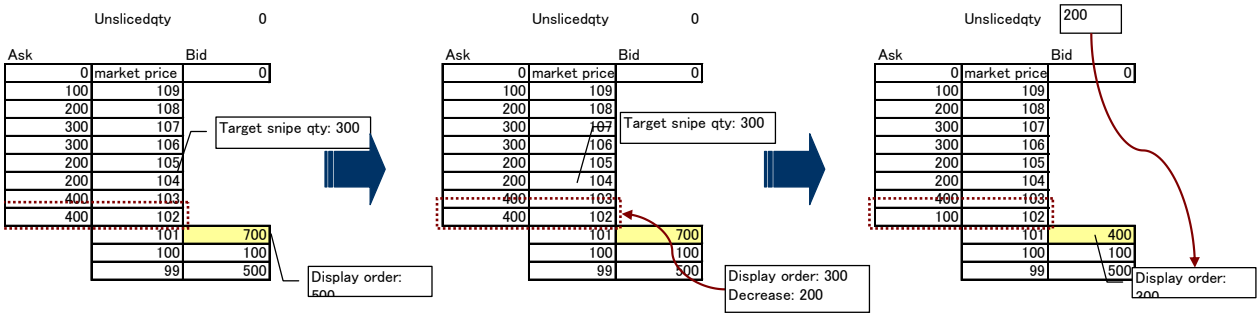


[Condition]
Style: Normal Limit price: 105 Unsliced qty: 1,200 Target snipe qty: 1,400
Target display qty: 500 Display order qty at market: 500 TriggerQty: 200, DontTakeQty: 100





[Condition]
Style: Passive Limit price: 105 Unsliced qty: 0 Target snipe qty: 300
Target display qty: 500 Display order qty at market: 500 TriggerQty: 200, DontTakeQty: 100



3.3 Logic to Calculate Limit to Display Qty

The way to calculate the quantity of child order from Display Qty or Display Qty Adjust Rate as follows:

No	Parameter	The way to calculate
1	Display Qty	1. Check Display Qty parameter ● Set 1 trading unit if Display Qty < 1 trading unit. 2. Calculate average trade size if Display Qty is null and AutoDisplay is Y. ● Equation to calculate average trade size: average trade size (except for open) = (average volume – average volume (am open) – average volume (pm open)) / average trade count ● Compare average trade size to 34 % (*1) of parent order quantity and set the smaller value to Display Qty. Set 1 trading unit if Display Qty < 1 trading unit. ● Use 1 trading unit if there is no average trade size. 3. No display qty if Display Qty is null and AutoDisplay is N. ● Set 0.(no display qty)
2	Display Qty Adjust Rate	1. Set 10% if Display Qty Adjust Rate parameter is null. * Can customize the default value of Display Qty Adjust Rate by configuration. (Ref. Chapter 7. Setting Parameters)

*1 This percentage set on Set up Parameter. Refer to [7.] Set Up Parameters.

3.4 Logic to Calculate TriggerQty / DontTakeQty

The way to calculate TriggerQty and DontTakeQty is as follows:

No	Parameter	The way to calculate
1	TriggerQty	1. Check parameter ● Set [trading unit x TriggerLots], if parameter is not set. 2. Adjust TriggerQty by trading unit ● Set RoundDown(TriggerQty, trading unit) ● Set trading unit, if parameter set < 1 trading unit.
2	DontTakeQty	1. Check parameter ● Set [trading unit x DontTakeLots], if parameter is not set. 2. Adjust DontTakeQty trading unit ● Set RoundDown(DontTakeQty, trading unit) ● Set 0, if parameter set < trading unit. 3. Check relation between TriggerQty and DontTakeQty ● Reject, if TriggerQty < DontTakeQty.

3.5 Applying Execution Ratio by Style

Speed to slice out becomes faster if the value of Style becomes bigger since Execution Ratio become higher.
Speed to slice out becomes slower if the value of Style becomes smaller since Execution Ratio become lower.

Value of Style	1	2	3	4	5	6	7	8	9
Selection to choose from FIX	Passive				Normal	Aggressive			
Execution Ratio	0%	0%	0%	10%	20%	35%	50%	65%	80%

3.6 Amending price type for display order

The way to amend price depends on the Style in Algo Parameter. The relationship between Style and amending type is as follows.

Value of Style	1	2	3	4	5	6	7	8	9
Selection to choose from FIX	Passive				Normal	Aggressive			
Amending type	near side price	near side price	near side price	near side price	near side price	limit price	limit price	limit price	limit price

3.7 Example [Aggressive]

[Parameters]

Order qty	10,000
Limit price	101
Diplay qty	1000
Diplay qty adj rate	10
Style	Aggressive
Auto display	Y
Min qty needed to snipe	1

1. 8:57 Receiving the order

Sniper does not slice out.

2. 8:59 Slice out

Sniper does not slice out snipe order and slice out display order.

Price is 101.

Order size is 1,100

Display qty[1,000] ± random(Display qty[1,000] x Display qty adj rate[0.1])[100]

Next execution size is 500

Order size x Execution Ratio [0.5]

unsliced qty 10,000

Ask		Bid
1000	market price	1500
300	107	
300	106	
300	105	
300	104	
300	103	
400	102	
700	101	
2,000	100	
	99	3,000
	98	800
	97	200
	96	200
	95	200
	94	200
	93	200
	92	200

unsliced qty 8,900

Ask		Bid
1000	market price	1500
300	107	
300	106	
300	105	
300	104	
300	103	
400	102	
700	101	
2,000	100	
	99	4,100
	98	800
	97	200
	96	200
	95	200
	94	200
	93	200
	92	200

3. 9:00 After open auction, 1,100 filled

1,100 qty is filled and fill event occurred.

On filled Event, Sniper checks the quote on far side within limit price and slices out snipe order if there are quote.

Next, Sniper checks display qty size. If display qty size is less than next execution size, slices out display order.

[Snipe order]

Price is 101.

Order size is 400.

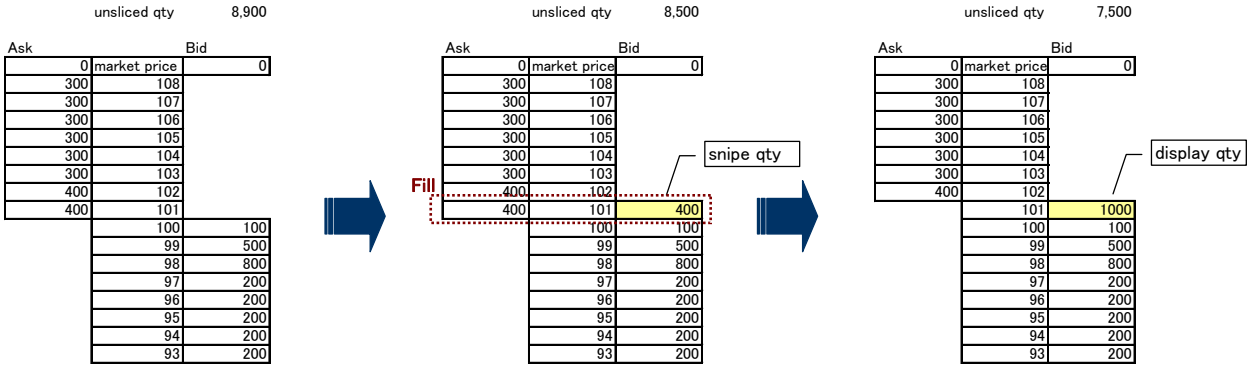
All visible quantity within limitp price [101]

[Display order]

Price is 101

Order size is 1,000

Display qty[1,000] ± random(Display qty[1,000] x Display qty adj rate[0.1])[0] - At market qty[0]



4. 9:05 700 filled

700 qty is filled and fill event occurred.

On filled Event, Sniper checks the quote on far side within limit price.Sniper does not slice out snipe order because there are not quote within limit price.

Next, Sniper check display qty size and slice out display order, because display qty size is less than next execution size.

[Snipe order]

Nothing

[Display order]

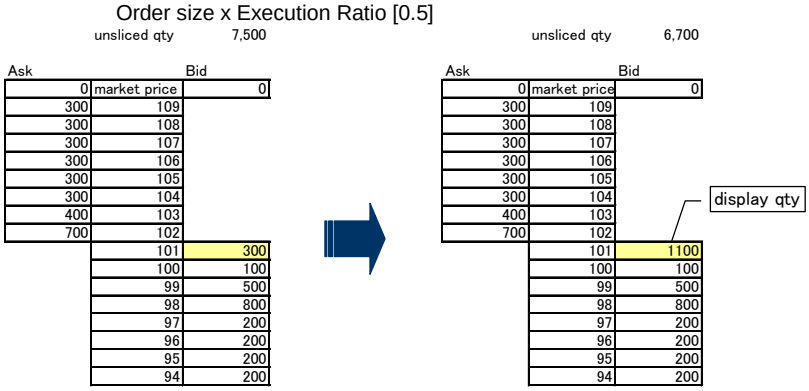
Price is 101

Order size is 800

Display qty[1,000] ± random(Display qty[1,000] x Display qty adj rate[0.1])[100] - At market qty[300]

Next execution size is 500

Order size x Execution Ratio [0.5]



5. 10:00 1000 filled

4. Parent Order Amendment

4.1 Amendable Parameters

Sniper algorithm allows the following parameters to be amended.

No	Amendable Parameters	Reanalyze
1	Order Qty(increase)	Y
2	Order Qty(decrease)	N
3	Limit Price	N
4	Start Time	Y
5	End Time	N
6	Style	Y
7	Display Qty	Depends
8	Display Qty Adjust Rate	Depends
9	TriggerQty	N
10	DontTakeQty	N
11	AutoDisplay	Y

* Order will reanalyze if 1 or more parameters which need to reanalyze included to the parameters amended.
See “Requirement of Standardization of Amending Parent Order” for details.

4.1.1 Amending Display Qty and Display Qty Adjust Rate

After amended Display Qty or Display Qty Adjust Rate, if any amended order‘s child order has more quantity than Max Execution Qty, reanalyze the order.

4.2 Restrictions

If the order status is one of the following cases, the order is not amendable and amend request is rejected.

- While the order status is canceling
- When the order status is already fully filled
- When DoneForDay has been already sent to client
- After trading session

5. Set Up Parameters

No	Setup Parameter Name	Description	Default Value
1	sniper-display-qty-adjust-rate	Value will be used as algorithm parameter of Display Qty Adjust Rate if the parameter is blank. The rate is used to calculate the max/min quantity to slice out from the Display Qty.	10(%)
2	sniper-max-display-parent-order-rate	Set the max percentage to calculate the algorithm parameter of Display Qty from parent order quantity.	50(%)
3	sniper-cancel-delay-time	IOC delay time.This is the times from senting snipe order to senting cancel order.	10 milli sec
4	sniper-open-shift-time	Slice out shift time at auction.	60 sec

5.1 How the delay works

“DelayTime” (defined algo template) and “snipe-cancel-delay-time” (defined set up parameter) work as follows.
The purpose of “DelayTime” is adjusting market data lag.