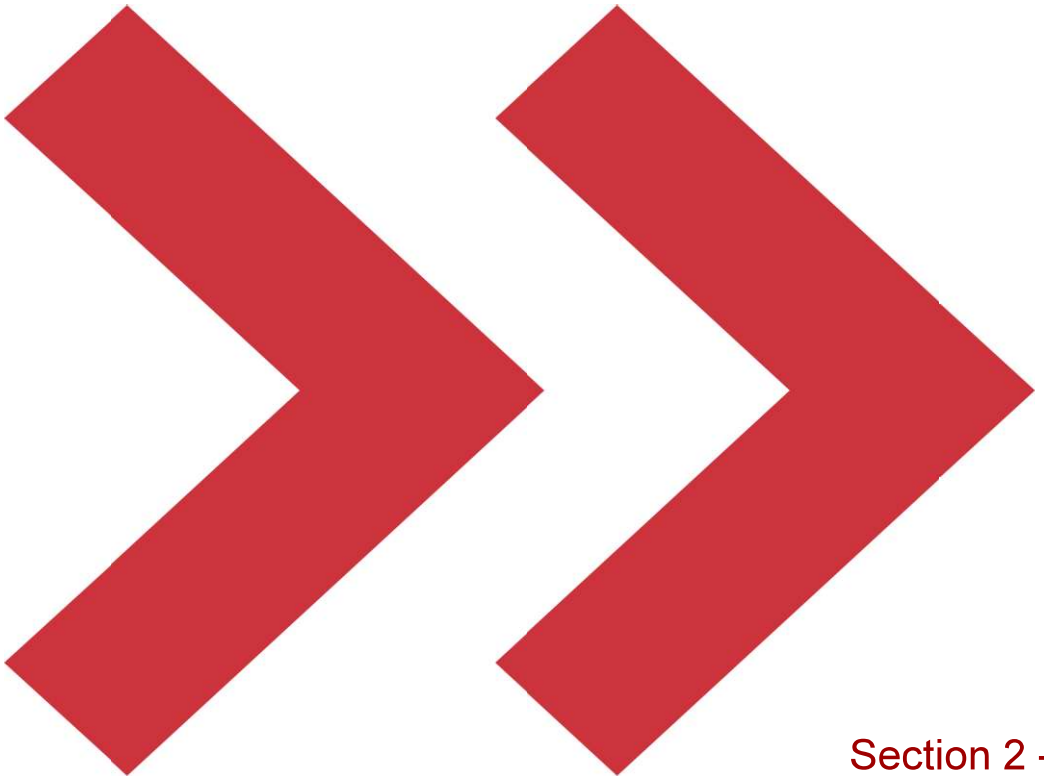


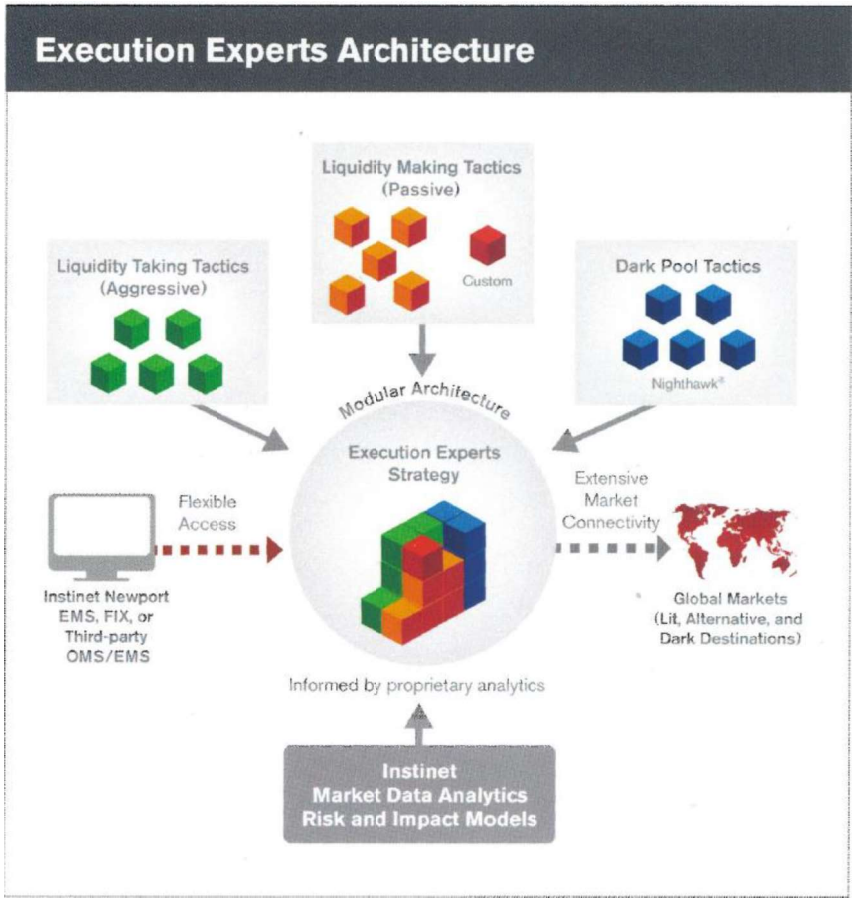
Section 2 – Instinet's Electronic Trading Product Suite

Instinet
A Nomura Company

Instinet Execution Experts® - Suite Overview

- Global, event-driven algorithmic trading strategies

- Event Driven
  - Evaluate price levels and spreads to identify appropriate times to provide liquidity, take liquidity or stay out of the market
- Customisable
  - Experts® platform supports customization at multiple levels, from venue access and default parameterisation to entirely bespoke behaviour
- Dark Pool Access
  - The Experts dark liquidity aggregation strategy, Nighthawk®, offers protection against gaming and adverse selection using its short term pricing model to validate new price levels over the trading session. Nighthawk's logic is used by all Experts® strategies
- Scalable
  - No dedicated server or deployment required for each strategy. Significantly reduced capacity risk to one particular strategy on a high-volume day. Four generic servers can behave as any of the strategies, or all at the same time. Additional capacity can be gained by adding a single server



Execution Experts® - Risk Controls Overview

- Instinet's Execution Experts® algorithmic trading platform supports a comprehensive set of sophisticated agency-only trading strategies that are operated and monitored in real time by Instinet's global support organisation using advanced reporting, alerting and control software
- Pre-Trade Validation
  - The Experts® have a robust pre-trade validation process with default settings on order value, limit price, trade quantity and percentage of ADV, among others, that can be customized per user or client. Clients can select whether orders will be automatically rejected, paused or routed to Instinet's trading desk when validation events are triggered
- Real-time Strategy Controls
  - In addition to pre-trade controls, the Experts continuously monitor price movements, both relative and versus a specified benchmark. They will pause trading of any order where a user-specified max price move has been hit and send a message to Instinet's support staff. If no action has been taken within a reasonable time on a paused order, the Experts will automatically escalate it up the support chain
- Operational Monitoring
  - Instinet's Global Trading Operations team monitors performance of the Experts algorithms using advanced operational dashboards and consoles. All components of the platform can be controlled through the dashboard, including a full shutdown of the system
- Systematic Controls
  - Additional risk mitigation controls are present throughout the entire Instinet trading platform, from the algorithms down through the market gateways
- Rigorous QA and Release Processes
  - Instinet employs rigorous testing processes to ensure any new trading logic has been fully vetted and checked within simulated real-world conditions prior to release. Full releases can be reverted within the trading day as quickly as within 10 minutes
- Further detailed information is available in Appendix B

Execution Experts® - Nighthawk® Allocation

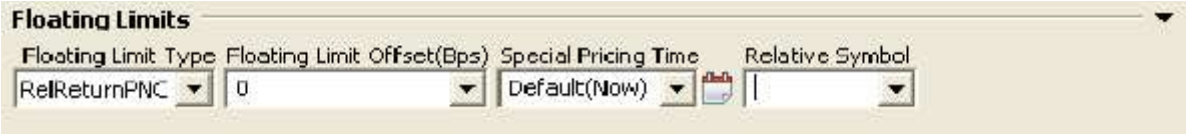
- A flexible, convenient way of incorporating Nighthawk's intelligent dark aggregation logic into a wide range of Experts® strategies

- Parameters
  - ***Nighthawk Alloc (%)*** – the maximum percentage of the whole order Nighthawk is allowed to work. The default is 0 in all benchmark-driven or participation-driven strategies
  - ***Max Dark Exposure (%/shrs)*** – the maximum quantity or percentage of your order you're happy for Nighthawk to expose at any one time. A supplied value of less than or equal to 100 is interpreted as a percentage of the parent order. A supplied value of greater than 100 is treated as a number of shares. The default is 0 in all benchmark-driven or participation-driven strategies
  - ***Min. Dark Fill Qty*** – Send a min acceptable fill size to venues that support it. Minimise your interaction with small dark orders when concerned about information leakage
  - ***Nighthawk Limit Px*** – Supply a separate/additional limit price solely for submissions made by Nighthawk. Be more passive in the dark if desired

- Principal effects on core strategies
  - ***Participation-driven Strategies*** (PART, StepPART, DynaPART) - Dark fills from Nighthawk Allocation are tracked separately and discounted from participation rate tracking. If Nighthawk Allocation trades a large block in the dark there is no break in lit trading. The algorithm will automatically rebalance quantity between Nighthawk Allocation and the core participation strategy when necessary
  - ***Benchmark-driven Strategies*** (VWAP, TWAP, IS, TEN, TClose, TOpen) - Dark fills from Nighthawk Allocation are tracked separately and not included when calculating whether the algorithm is obeying the max volume constraint. If a "significant" fill is received the profile will be recalculated for the balance so there is no break in trading
  - ***Tactical Strategies*** (BlockPeg, Cobra, WORK) - Large dark fills are part of the intention so the strategy will carry on as normal

Execution Experts® - Floating Limits

- A wider, more flexible range of floating limit options available in all core Experts® strategies



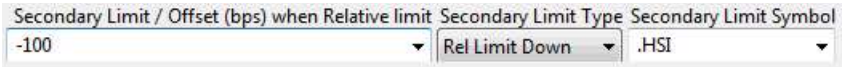
- Parameters
  - ***Floating Limit Type*** – the floating limit type to be applied (see table 1 below for details). Default is no floating limit.
  - ***Floating Limit Offset*** – an optional offset against the selected Floating Limit Type parameter, specified in basis points
  - ***Special Pricing Time*** – the option to define a specific start time, at which to begin applying the selected Floating Limit Type. The default is "now"
  - ***Relative Symbol*** – a specific, user-defined reference symbol for calculating relative floating limits (see table 2 below for defaults)

Floating Limit Type	Description
ArrivalPrice	Use the snap mid
ArrivalMarket	Use the snap FarTouch
AvgPxLim	Use the average traded price on the order (no limit on first trade)
AP/PNCRelReturn	Use the most passive of ArrivalPrice and RelReturnPNC above
DailyHiLowLimit	Use a rolling high/low limit (high for buys, low for sells)
LastPriceLim	Use the rolling last traded price
None	Do not apply a Floating Limit (default)
PrimaryOpen	Use Symbol's Open Price
RelReturnClose	+/- Floating Limit Offset vs. Relative Symbol's PNC (default is local market index)
RelReturnOpen	+/- Floating Limit Offset vs. Relative Symbol's Open (default is local market index)
RelativeReturn	+/- Floating Limit Offset vs. Relative Symbol's price at arrival (default is local market index)
RollingRelativeReturn	+/- Floating Limit Offset vs. Rolling Relative Symbol's price with a user specified rolling window (default 5 mins)
VWAPLimit	Use the rolling primary-market on-exchange VWAP

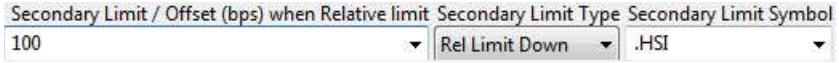
Country	Index
Japan	TOPIX
Singapore	FT Strait Times Index
Australia	All Ordinaries
Korea	KOSPI Composite Index
Taiwan	Taiwan SE Weighted Index
Hong Kong	Hang Seng Index
Malaysia	FTSE Bursa Malaysia KLCI Index
New Zealand	NZSX 50 Free Index
Indonesia	JSX Composite Index
India	S&P CNX NIFTY
Philippine	Philippine Composite Index
Thailand	Thailand SET Index

Execution Experts® - Secondary Limits

- Trading Characteristics and execution behavior
  - The lower limit to be applied on the order
  - Example: If secondary limit $5 was specified for a Buy order, Algo will NOT buy the stock below $5
- Parameters
  - Secondary Limit / Offset bps: The secondary limit price / offset bps when using relative secondary limit
  - Secondary Limit Symbol: A specific, user-defined reference symbol for calculating relative secondary limit
  - Secondary Limit Type:
    - Type = **STOP**
      - Secondary limit will behave like hard limit trading behavior. i.e. Buy order with $5 secondary limit, algo will stop trading if market is below $5 and start trading again if market is above $5. Order will stay live in Algo engine
    - Type = **LIMIT**
      - As soon as the market hit the specified secondary limit, the parent order will be cancelled back to user. i.e. Buy order with $5 secondary limit, algo will cancel the parent order back if market hits below $5 price
    - Type = **Rel Limit Down**
      - Offset relative limit = **-100**



        - For BUY order
          - The order will pause: When the relative return **has fallen** more than 1% vs Secondary symbol
        - For SELL order
          - The order will pause: When the relative return **has risen** more than 1% vs Secondary symbol
      - Offset relative limit = **100**



        - For BUY order
          - The order will pause: When the relative return **has fallen** more than 1% vs Secondary symbol
        - For SELL order
          - The order will pause: When the relative return **has risen** more than 1% vs Secondary symbol

Trading Algorithm Definition - Nighthawk®

Trading Characteristics and execution behaviour

- Nighthawk takes advantage of Instinet's high-speed connectivity to a wide variety of liquidity sources to aggregate a large number of alternative venues under one destination. In-built tactics are designed to maximise its chances of finding liquidity while reducing adverse selection, signalling and potential gaming. At the same time as attempting to maximize its chances of finding the other side, Nighthawk employs several techniques designed to protect clients' order flow from predatory participants. Nighthawk monitors short-term volatility to minimise the risk of providing liquidity at unattractive prices while sophisticated submission tactics and anti-gaming logic disguise the intention of the trade. Clients are able to exercise some control over the extent to which the anti-gaming measures are used by selecting one of a number of different execution styles. Instinet's agency position allows us to aggregate a wide range of broker venues that would be unavailable to other
- Nighthawk connects to BlockMatch Asia and other third party liquidity sources. Clients can opt-in or out of any liquidity sources. Please reach out to coverage on a list of liquidity sources option and/or third party ALP guidelines.

Available Parameters

Field	Behaviour
Start Time	Configure a start time for the algorithm. The default is the later of the point of order arrival and the open
End Time	Configure an end time for the algorithm. The default is the end of the continuous trading period
Style	Determine the relative aggression and amount of anti-gaming employed by the algorithm. Options are ▪ ***Passive*** **–** will send orders pegged to the near touch price ▪ ***Normal*** **–** will send orders pegged to the mid point of the spread ▪ ***Aggressive*** and ***Super-Aggressive*** **–** will send orders pegged to the far touch In addition, the more the aggression of the style parameter is increased, the more some of the anti-gaming measures are reduced
Floating Limit Type	See slide 12 for available floating limit types
Floating Limit Bps	Add an offset for the floating limit in basis points
Max Rate %	Add a max participation rate cap to the order
Min Dark Fill	Allow the user to define a min fill quantity for orders to dark venues. For venues that accept the parameter, the order will receive no fills smaller than this size

Trading Algorithm Definition - Nighthawk® - (cont'd)

- In addition to the parameters described above we are able to apply defaults on the Instinet side for the following anti-gaming switches in Nighthawk
  - FADE – raises/lowers adverse selection protection (on by default)
  - Footprint Minimisation – add additional controls to the min fill quantities we send to accessible venues (on by default)
  - Walk-up protection – faster/slower following of prices in the dark venues as the primary market reference price moves (on by default)
- Risk and Control
  - Nighthawk is not designed to trade in the lit market. The only exception is if it is configured with an IWould Price. Under these circumstances, the validation of the supplied IWould Price is in accordance with all other strategies that support it. Details can be found in Appendix B. In practice, this is very rarely used
  - Outside of this, Nighthawk will not act in the primary market. As a result, protection mechanisms are designed to minimise the likelihood of information leakage and following adverse price movements in circumstances of extreme market conditions
- Things to watch
  - By default Nighthawk will be enabled for Chi-X in Japan. Chi-X Japan venue is not dark but a good source of liquidity. This venue can be disabled on client request.
  - Depending on the residual size and the number of venues available to the client, it could be the case that as the end of the order is approached there is insufficient residual to send orders to all possible venues. In this case, flow is rotated around the venues, with those venues from which we have received the most liquidity taking precedence initially
  - There is no difference in the sizing approach between marketable and non-marketable orders in Nighthawk
  - Venue resting times are affected by liquidity and queuing. In Nighthawk, if we are finding liquidity on other venues then the resting time on a particular venue might be quite short as the flow is reallocated to the venue showing the liquidity

Trading Algorithm Definition – WORK

- Trading Characteristics and execution behaviour
  - WORK's behaviour and execution style can be adapted to a variety of trading objectives by making adjustments to an easy-to-use instruction set. The aim of the strategy is to pace order flow in a more intuitive, signal-driven way, relaxing some of the constraints associated with benchmark-driven and participation-driven strategies that can lead to higher costs of trading. By monitoring real-time trading conditions, evaluating impact, fair prices and trading intensity as opposed to making trading decisions based predominantly on historical or real-time volume patterns, WORK is well positioned to determine when and how aggressively to place orders. As with most strategies in the Experts® platform, WORK also contains Nighthawk as a module to handle interaction with dark venues meaning that WORK benefits both from a complex, signal-driven approach to trading in lit markets and also from Nighthawk's dark aggregation logic.

- Available Parameters

Field	Behaviour
Start Time	Configure a start time for the algorithm. The default is the later of the point of order arrival and the open
End Time	Configure an end time for the algorithm. The default is the end of the continuous trading period
Style	Determine the urgency of the trade: ▪ ***Passive Only –*** no aggressive submissions. Liquidity provision only, both to lit venues and to dark venues using a primary peg ▪ ***Passive*** ▪ ***Normal*** ▪ ***Aggressive*** ▪ ***Super-Aggressive*** ▪ ***Aggressive-Only*** The more aggressive the style setting the faster the algorithm will attempt to trade the order and the more likely it will be to cross the spread. In addition, the more the aggression of the style parameter is increased, the more some of the anti-gaming measures are reduced for the Nighthawk module.
Max Part Rate	Add a max participation rate cap to the order (default is 35%)
Min Part Rate	Add a min participation rate floor to the order (default is 0%)

Trading Algorithm Definition – WORK (cont'd)

Field	Behaviour
Historical Max Part Rate	Add a max participation rate cap based on historical volume to the order (default is 0% i.e. not applied)
Max Rolling % Vol	Add a max participation rate cap based on x secs window rolling volume to the order (default is 0% i.e. not applied)
Rolling Part Rate Windows (secs)	Define the rolling window of Max Rolling % Vol
Use Composite Volume	Set a flag to instruct WORK to consider the volume from available alternate venues (e.g. CHIX) when applying the Max Participation Rate
Use Dark Liquidity	Instruct WORK to suppress all interaction with off-exchange venues during its normal operation
Enable Day Hi/Low Price Validation	Determines whether or not to limit the algorithm by the Day High / Low Price. Options are: ▪ ***Always On –*** always apply the Day High / Low Price Limits ▪ ***On Until Finish Up –*** apply the Day High / Low Price Limits until the algorithm tries to finish the order ▪ ***NONE –*** don't apply the Day High / Low Price Limits
Auction Type	Determines whether or not the algorithm will participate in any auctions. Options are: ▪ ***OPEN –*** just participate in the opening auction ▪ ***CLOSE –*** just participate in the closing auction ▪ ***ALL –*** participate in all scheduled auctions ▪ ***NONE –*** don't participate in any scheduled auctions
Auction Participation Target (%)	Allows a user-specified override for the percentage of the volume to target during the auction period
Completion Flavor	Determines whether or not the algorithm will try to complete the order. Options are: ▪ ***NONE (default) –*** *order may not be completed by end time* ▪ ***Smart Complete*** *- Aim to complete the order within Max Part Rate constraint* ▪ ***Must Complete*** *- Aim to complete the order even exceeding the Max Part Rate constraint*
Use Strict Min Part Rate	Set a flag to instruct WORK to strictly follow the Min Part Rate (cross spread immediately once falling behind)

Trading Algorithm Definition – WORK (cont'd)

Field	Behaviour
I Would Price	Define a price level at which the algorithm enters "I Would" mode. The algorithm's aim becomes to complete the order, or as much of it as possible, at this level. The max part rate constraint does not apply during periods where the price is at or better than the "I Would" price
I Would Px Qty Allocation	Define a percentage of the order / Number of shares to be completed by "I Would"
I Would Px Qty Allocation Type	Define the unit of I Would Px Qty Allocation. Options are: ▪ ***Number of Shares*** – I Would Px Qty Allocation is specified in number of shares ▪ ***Percent*** – I Would Px Qty Allocation is specified in percent of the order
Aggressive In The Money	Ask WORK to accelerate its trading slightly when the stocks price is favorable relative to the arrival price. The acceleration is gentle so as to minimize additional adverse selection costs
Custom Aggr in the Money	Ask WORK to accelerate its trading slightly when the stocks price is favorable relative to the specified reference price (i.e. AVGPXVSPNC / LAST / OPEN / PRIMARY / MARKET / PNC / BID / ASK / MID / UNADJUSTED_PNC) . The acceleration is gentle so as to minimize additional adverse selection costs
Nighthawk Allocation %	Define a percentage of the order to be handled by Nighthawk over and above standard dark pool interaction in WORK. For example if 20% is entered, WORK will work the order as normal but give 20% of the quantity to Nighthawk to try and find block liquidity with in the meantime.
Nighthawk Limit Price	Define a separate, additional limit price for the Nighthawk Allocation percentage piece of the order
Max Dark Exposure	Configure a maximum quantity of the Nighthawk Allocation percentage that can be exposed to dark venues at any one time
Min Dark Fill	Define a minimum acceptable fill size to all venues that support it.
Secondary Limit	See slide 13 for available parameters for Secondary Limit
Block Exclusion	Defines the size of block trades beyond which, those trade blocks will be ignored in volume calculation by Algo. i.e. Any trades above the specified Block Exclusion Value will be excluded

Trading Algorithm Definition – WORK (cont'd)

- Risk and Control
  - Instinet has a default set of cap limit checks applicable per-slice and price range checks which vary per market. These and other limits can be customized based on individual client requirements
  - Recommendations would include orders greater than a certain percentage of ADV, limit prices more aggressive than a certain percentage through the current far touch, order size or value greater than a specified amount, etc. We are happy to work with clients on any custom checks they wish to put in place for their flow
  - Further details on platform checks and price controls can be found in Appendix B
  - WORK's tactics contain the concept of a "fair price" which the strategy uses to restrict trading during sudden price moves in the market
  - If completion flavor is set as 'Smart Complete' then the algorithm will increase its urgency to attempt to complete the order within max volume constraint specified. If completion flavor is set as 'Must Complete' then the algorithm will increase its urgency to attempt to complete the order and may exceed max volume constraint specified. We would recommend only using Must Complete with a price constraint so as to limit the potential impact of a large order with a short trading horizon
  - For Must Complete Work orders, if algo calculated required finish up rate is more than 40%, Experts would pause the order with notification to review the order. The trader can review the price controls and order can be released if the order has been set with appropriate parameters (example – submitted with 5% rolling relative return floating limit)
- Things to watch
  - If market conditions dictate that it is favorable to do so, Work will attempt to provide liquidity at different levels on the book (up to multiple different price levels). The size of those orders is determined as per calculated passive market making rate, so as to reduce signaling risk
  - Aggressive submissions made by Work are always sized to minimize price impact.
  - The Max Part Rate parameter can be overridden if any specified I Would Price is reached in the market or by Must Complete behavior.

Trading Algorithm Definition – MAKE

- Trading Characteristics and execution behaviour

  - MAKE is a sophisticated strategy for passive-side trading. Using historical information, recent trading patterns and real-time market data, MAKE sizes and distributes child orders at multiple price levels and across destinations, controlling adverse and negative selection costs while reducing exposure to signalling, gaming and predatory techniques. MAKE's advanced tactics are controlled by a simple yet highly customisable control interface, allowing users to set a range of different styles of liquidity providing, from "patient" to "urgent". MAKE also uses Instinet's FADE logic to pause or slow trading under potentially adverse market conditions to reduce adverse selection. At higher urgency levels, with emphasis on minimising negative selection, child orders will tend to be larger and more frequent. As with most strategies in the Experts® platform, MAKE also contains Nighthawk as a module to handle provision of liquidity on multiple dark venues. MAKE is well-suited for low information trades where opportunity cost is less important than impact reduction – particularly at low or moderate urgency levels – or large orders, where limiting information leakage and potential signalling is paramount. At higher urgency levels, it can also be used effectively for trades with higher opportunity costs, trading larger volumes while remaining passively priced.

- Available Parameters

Field	Behaviour
Start Time	Configure a start time for the algorithm. The default is the later of the point of order arrival and the open
End Time	Configure an end time for the algorithm. The default is the end of the continuous trading period
Style	Determine the style for liquidity provision: ▪ ***Opportunistic*** ▪ ***Normal*** ▪ ***Strict*** The more aggressive the style setting the higher the urgency for liquidity provision. Order sizing at higher urgencies will tend to be larger and submissions made more frequently (sensitivity to negative selection). At lower urgencies, FADE signals will be more sensitive to potentially adverse market conditions (sensitivity to adverse selection).
Max Part Rate	Add a max participation rate cap to the order (default is 35%)

Trading Algorithm Definition – MAKE (cont'd)

Field	Behaviour
Auction Type	Determines whether or not the algorithm will participate in any auctions. Options are: ▪ ***OPEN*** **–** just participate in the opening auction ▪ ***CLOSE*** **–** just participate in the closing auction ▪ ***ALL*** **–** participate in all scheduled auctions ▪ ***NONE*** **–** don't participate in an scheduled auctions
I Would Price	Define a price level at which the algorithm enters "I WOULD" mode. The algorithm's aim becomes to complete the order, or as much of it as possible, at this level. The max part rate constraint does not apply during periods where the price is at or better than the "I WOULD" price
FADE Logic	Ask MAKE to activate FADE signals for the trade. Based on several factors, the FADE signals will instruct MAKE slow or pause briefly when potentially adverse market conditions are detected. The signals are most sensitive at lower urgency settlings (represented by a more opportunistic style setting)
Aggressive In the Money	Ask MAKE to try and accelerate its trading slightly when the stocks price is favourable relative to the arrival price. The acceleration is gentle and takes the form of increased urgency in provision by size and order frequency so as to control additional adverse selection costs
Nighthawk Allocation %	Define a percentage of order to be handled by Nighthawk over and above standard dark pool interaction in MAKE. For example if 20% in entered, MAKE will work the order as normal but give 20% of the quantity to Nighthwak to try and find block liquidity with in the meantime.
Nighthawk Limited Price	Define a separate, additional limit price for the Nighthwak Allocation percentage piece of the order
Max Dark Exposure	Configure a maximum quantity of Nighthawk Allocation percentage that can be exposed to dark venues at any one time
Min Dark Fill	Define a minimum acceptable fill size to all venues that support it
Nighthawk Style	Override the Style parameter for the Nighthawk allocation portion of the trade. By default the Style is inherited from the style passed to MAKE

- In addition, users have access to all Floating/Relative Limit parameters defined on p. 12 of this pack

Trading Algorithm Definition – MAKE (cont'd)

- Risk and Control
  - Instinet has a default set of cap limit checks applicable per-slice and price range checks which vary per market. These and other limits can be customised based on individual client requirements
  - Recommendations would include orders greater than a certain percentage of ADV, limit prices more aggressive than a certain percentage through the current far touch, order size or value greater than a specified amount, etc. We are happy to work with clients on any custom checks they wish to put in place for their flow
  - Further details on platform checks and price controls can be found in Appendix B
  - MAKE is a liquidity-providing algorithm. As such it will not attempt to cross the spread in any lit market regardless of the urgency setting.

- Things to watch
  - For MAKE orders in Strict style, or with a Nighthawk Allocation set and an override in the Nighthawk Style to Aggressive or Super-Aggressive, the portion of MAKE handled by Nighthawk could be made to cross the spread in dark venues only. As above, MAKE will never cross the spread on lit venues

Trading Algorithm Definition – Cobra

- Trading Characteristics and execution behaviour
  - Cobra is designed to minimise signalling and market impact while maximising shares traded. It will pursue liquidity aggressively in lit markets as well as attempting to find the other side of a trade in dark venues via the dark aggregation logic contained in Instinet's Nighthawk® aggregation algorithm. Cobra purposely alters trading tactics in an attempt to avoid predictable patterns that other market participants could recognise and potentially exploit. Users can adjust execution style to influence the frequency and sizing of order submissions; the more aggressive the setting the more likely Cobra is to strike and the smaller the residual quantity on the book will be. In a further attempt to reduce signalling Cobra does not post passively on the primary market.

- Available Parameters

Field	Behaviour
Start Time	Configure a start time for the algorithm. The default is the later of the point of order arrival and the open
End Time	Configure an end time for the algorithm. The default is the end of the continuous trading period
Style	The style parameter is used to control the extent to which Cobra will disguise its trading activities while attempting to minimise market signal risk. Style options are ▪ ***Passive*** ▪ ***Normal*** ▪ ***Aggressive*** ▪ ***Super-Aggressive*** The more aggressive the style selection, the more the signal protection mechanisms are reduced
Max Part Rate	Add a max participation rate cap to the order (default is 100%)
I Would Price	Define a price level at which the algorithm enters "I Would" mode. The algorithm's aim becomes to complete the order, or as much of it as possible, at this level. The max part rate constraints do not apply during periods where the price is at or better than the "I Would" price
Size Trigger Override	Provide a concrete number of shares as the aggressive order trigger size. Override the trigger size calculated by the algorithm
Use Dark Liquidity	Instruct Cobra to suppress all interaction with off-exchange venues during its normal operation

Trading Algorithm Definition – Cobra (cont'd)

Field	Behaviour
Nighthawk Allocation %	Define a percentage of the order to be handled by Nighthawk over and above standard dark pool interaction in Cobra. For example if 20% is entered, Cobra will work the order as normal but give 20% of the quantity to Nighthawk to try and find block liquidity with in the meantime. The default allocation is 100%
Nighthawk Limit Price	Define a separate, additional limit price for the Nighthawk Allocation percentage part of the order
Max Dark Exposure	Configure a maximum quantity of the Nighthawk Allocation percentage that can be exposed to dark venues at any one time
Min Dark Fill	Define a minimum acceptable fill size to be sent to all venues that support it
Floating Limit Type	See slide 12 for available floating limit types
Floating Limit Bps	Add an offset for the floating limit in basis points

- **Risk and Control**
  - Instinet has a default set of cap limit checks applicable per-slice and price range checks which vary per market. These and other limits can be customized based on individual client requirements
  - Orders sent to the Super-Aggressive style of Cobra must be supplied with a firm limit price (max of 3% or 3 ticks from last). Other styles of Cobra are deliberately designed such that they will leave the primary market spread intact when they are triggered to take liquidity aggressively. Super-Aggressive style will not, hence the requirement for a firm limit price.
  - The core premise of signal minimization means that the strategy has several features designed to reduce the likelihood of moving a stock's price in all but the most aggressive style setting
  - Further details on platform checks and price controls can be found in Appendix B
- **Things to watch**
  - In less aggressive styles it is possible that Cobra will not strike to take liquidity aggressively even when there is significant size on the far touch. This is a feature of the signal minimization logic. The frequency with which significant far touch sizes are skipped to disguise trading intention is reduced the more aggressive the style setting
  - When the Size Trigger Override parameter is supplied, Cobra will trigger on all quotes it sees above that size and less attempt is made to disguise its intentions

Trading Algorithm Definition – BlockPeg®

- Trading Characteristics and execution behaviour
  - BlockPeg is a tactical algorithm capable of satisfying a wide range of trading styles depending on the Style parameter selected. In its Passive style, BlockPeg is designed solely to provide liquidity, not crossing the spread. Submissions are sized relative to the stocks historical and real-time norms so as to reduce signalling as far as is possible. As more aggressive styles are selected the purpose of BlockPeg shifts from providing passive liquidity to working both sides of the spread. Passive liquidity is still sized in a similar way but liquidity is also removed from the far touch opportunistically, leaving the spread intact. In its most aggressive style, the purpose becomes "get done around here". BlockPeg will attempt to work both sides of the spread within the supplied limit price, taking everything that's available and placing larger submissions on the near touch. Trades using this Super-Aggressive style tend to have very high urgency. In all styles, interaction with the primary market spread is complemented by the dark aggregation logic contained in Instinet's Nighthawk® aggregation algorithm. In this way it is possible to have submissions from BlockPeg working the primary, mid point and far touch of the stock's spread simultaneously
- Available Parameters

Field	Behaviour
Start Time	Configure a start time for the algorithm. The default is the later of the point of order arrival and the open
End Time	Configure an end time for the algorithm. The default is the end of the continuous trading period
Style	The style parameter is essentially used to control the extent to which BlockPeg will interact with the far touch. Style options are ▪ ***Passive –*** no far touch interaction. Passive and primary-peg dark liquidity only ▪ ***Normal*** ▪ ***Aggressive*** ▪ ***Super-Aggressive –*** considerable far touch interaction. Firm limit price mandatory The more aggressive the style selection, the more readily BlockPeg will interact with the far touch
Max Part Rate	Add a max participation rate cap to the order (default is 100%)
I Would Price	Define a price level at which the algorithm enters "I Would" mode. The algorithm's aim becomes to complete the order, or as much of it as possible, at this level. The max part rate constraints do not apply during periods where the price is at or better than the "I Would" price

Trading Algorithm Definition – BlockPeg® (cont'd)

Field	Behaviour
Size Trigger Override	Provide a concrete number of shares as the aggressive order trigger size and override the size calculated by the algorithm
Quote Size To Leave	Based on the style selected, BlockPeg will determine a suitable quantity to leave behind so the spread remains intact. The default is to allow the algorithm to calculate this. Should it be necessary, the algorithm's leave quantity can be overridden with a fixed number of shares.
Display Qty	BlockPeg will determine a suitable quantity to post passively based on historical and real-time quote statistics. The default is to allow the algorithm to calculate this. Should a Display Qty parameter be supplied, BlockPeg will use it to size passive submissions without randomisation
Use Dark Liquidity	Instruct BlockPeg to suppress all interaction with off-exchange venues during its normal operation
Nighthawk Limit Price	Define a separate, additional limit price for the Nighthawk Allocation percentage piece of the order
Max Dark Exposure (%/shrs)	Configure a maximum quantity of the Nighthawk Allocation percentage that can be exposed to dark venues at any one time.
Min Dark Fill	Define a minimum acceptable fill size to send to all venues that support it
Nighthawk Style	Allow for a separate configuration of dark interaction. By default the Nighthawk dark interaction style will inherit from the parent strategy style (i.e. if BlockPeg Passive is selected then any quantity allocated to Nighthawk will be handled with Nighthawk also operating in Passive style). The Nighthawk Style parameter allows for the Nighthawk portion to be worked with a different style (e.g. Aggressive)
Floating Limit Type	See slide 12 for available floating limit types
Floating Limit Bps	Add an offset for the floating limit in basis points

Trading Algorithm Definition – BlockPeg® (cont'd)

- Risk and Control
  - Instinet has a default set of cap limit checks applicable per-slice and price range checks which vary per market. These and other limits can be customised based on individual client requirements
  - Orders sent to the Super-Aggressive style of BlockPeg must be supplied with a firm limit price (max of 3% or 3 ticks from last). Other styles of BlockPeg are deliberately designed such that they will leave the primary market spread intact when they are triggered to take liquidity aggressively. Super-Aggressive style will not
  - The core premise of the signal minimisation logic inherited from Cobra means that the strategy has several features designed to reduce the likelihood of moving a stock's price in all but the most aggressive style setting
  - Further details on platform checks and price controls can be found in Appendix B

- Things to watch
  - In less aggressive styles it is possible that BlockPeg will not strike to take liquidity aggressively even when there is significant size on the far touch. This is a feature of the signal minimisation logic inherited from Cobra. The frequency with which significant far touch sizes are ignored to disguise trading intention is reduced the more aggressive the style setting
  - When the Size Trigger Override parameter is supplied, Blockpeg will trigger on all quotes it sees above that size and less attempt is made to disguise its intentions
  - If a Display Quantity is supplied to use as the basis for passive submission sizing, no size randomisation will be used

Trading Algorithm Definition – STOP

- Trading Characteristics and execution behaviour
  - The STOP strategy is designed to handle stop limit- or stop loss-type trades should a stock's price fall or rise to a pre-defined trigger point. The trigger point can be defined as a fixed price or calculated as a trailing price, relative to the high/low of the comparison price since the stop order was entered.

- Available Parameters

Field	Behaviour
Limit Price	An optional parameter to define a firm limit price for the stop order
Stop Type	Determine the type of stop order to be used: ▪ ***Fixed (default)*** ▪ ***Trailing Pct.*** ▪ ***Trailing Pct. w\ Limit Offset*** ▪ ***Trailing Val.*** ▪ ***Trailing Val. w\ Limit Offset***
Stop Price	Set the comparison price to determine whether or not the stop order has been triggered
Compare Stop Price With	The price from real-time market data that, when compared against the fixed or trailing Stop Price, will determine whether or not the stop order is triggered: ▪ ***Last (default)*** ▪ ***Mid*** ▪ ***Bid*** ▪ ***Ask*** ▪ ***Primary*** ▪ ***Market***
Trailing Amount	Calculate the stop price dynamically based on a value or percentage offset from the "Compare Stop Price With" reference price. The dynamic trailing price is adjusted passively as quotes or trades are processed, but never aggressively. Not available for Fixed stop orders.
Limit Offset	Adjust the trigger price with an offset in either value or percentage terms to calculate a dynamic limit for the stop order. The limit offset can be configured to act as a more restrictive limit price relative to the firm limit on the order when both are supplied. Available for Trailing stops only.

Trading Algorithm Definition – STOP (cont'd)

Risk and Control

- Instinet has a default set of cap limit checks applicable per-slice and price range checks which vary per market. These and other limits can be customised based on individual client requirements
- Recommendations would include orders greater than a certain percentage of ADV, limit prices more aggressive than a certain percentage through the current far touch, order size or value greater than a specified amount, etc. We are happy to work with clients on any custom checks they wish to put in place for their flow
- Further details on platform checks and price controls can be found in Appendix B
- STOP contains several pre-trade checks in addition to the recommendations above to help reduce the likelihood of a size error by users:
  - If the stop order's size exceeds a market-specific size threshold, the order is paused and an alert generated so the client can be informed
  - For IPO stocks the pause-and-alert threshold is set at ten round lots by default. This value can be changed intra-day subject to review by Instinet's algorithm and compliance teams
- STOP orders, unless correctly entered and controlled, can cause significant market impact. As a result there are several safety features built into Instinet STOP. To help avoid a stop order moving the market considerably, only limit orders will be submitted by the strategy; Instinet STOP will never submit true market orders. The limit price submitted will be the more restrictive of
  - The client limit (if specified)
  - The Limit Offset price (if a trailing stop is used)
  - A market-specific aggressive offset: currently the least restrictive of 2% or four ticks from the last traded price

Things to watch

- STOP orders are not active during auction periods and are only triggered by whole-lot, on-exchange, primary market prints
- STOP orders are sent as limit orders by default. This can be changed per client to IOC or simulated IOC if preferred.
- It is possible that there is insufficient liquidity on the book up to the calculated limit price. Any balance will be left live.

Trading Algorithm Definition – PAIRS

- Trading Characteristics and execution behavior
  - Instinet's Pairs strategy realizes the desired spread on a pair of equities (buy and sell)
  - Normal Pairs are defined in terms of the spread between the pair of equities (buy and sell).
  - M&A Pairs are defined in terms of the ratio between the pair of equities (buy and sell) and any cash consideration.
  - Relative Pairs are defined in terms of the relative return between the pair of equities (buy and sell).
  - The pair terms (desired ratio between the pair of the equities) is set by the User as a trading instruction.
  - Pairs strategy trading is initiated by the trigger (desired ratio set by User).
  - The Pairs strategy will trade whenever it is in/near range (desired ratio set by User), in other words, when the current value given by the specified relationship meets or exceeds the trigger value between the pair of equities (buy and sell)

- Parameters

Field	Behaviour
Start Time	Time to begin trading the order. Default is now or market open if the order is submitted before the open.
End Time	Time to stop trading the order. Default is market close.
Firm Limit	The hard limit price for the order.
Style	Execution style for the order **— Normal, Opportunistic or Strict** (default). ▪ **In Strict mode**, the strategy will trade whenever the pair is within range and catch up as aggressively as necessary on the other side ▪ **In Opportunistic mode**, the strategy trades relatively slowly taking care not to impact price and allows greater risk on the Init Side to trade even when not enough shares on the catch-up side are immediately available to balance the trade

Trading Algorithm Definition – PAIRS (cont'd)

Field	Behaviour
Buy/Sell Terms Ratio	In a deal (such as an acquisition or merger), the ratio of the share allocation between the buying/acquiring company and the company being bought/acquired in the terms of the deal for the buy/sell side of the Pair.
Buy/Sell Terms Cash	In a deal (such as an acquisition or merger), the additional cash value offset (expressed in dollars) between the buying/acquiring company share price and the company being bought/acquired share price in the terms of the deal for the buy/sell side of the pair.
Trigger Method	The definition to use for the relative pricing between the buy and sell securities.
Trigger Value	The value amount that will trigger trading entered as a decimal number.
Trigger Value Currency	The currency to use in evaluating if the criteria between the pair has been met. If trading a multi-currency pair, you can set the value to LOCAL to bypass the dynamic foreign exchange rate conversion and use no conversion. In this case, you should take a static rate into account when you calculate the appropriate trigger value.
Max Part Rate	The maximum participation rate for the order (default=100%). The Pairs strategy pauses trading when it reaches this limit to ensure that the volume of trades does not exceed the number of shares established by this percentage.
Trading Ratio	Specifies the balance that should be maintained between the two securities. ▪ **Maintain Shares:** maintains the share balance between the buy and sell securities. ▪ **Cash Balance:** ensures that the trading remains cash neutral. ▪ **Pair Terms**: uses the supplied ratio defined in the pair terms (buy/sell ratio) to maintain balance
Init Side	The side—Buy, Sell or Sell Short—that should lead in the pairs trading. The lead side will be entered as a limit order. The other side(s) catches up to maintain the balance defined in the relationship, acting as aggressively as necessary. "Auto" assigns the most illiquid side as the Init Side.
Max Sub Dollars	The maximum submit dollars amount ensures that the trade gets done in acceptably small units to minimize risk. It limits submissions to less than or equal to the dollar amount entered. This value applies to both dollar-neutral and ratio pairs.
Aggregation Tag	The Aggregation Tag allows you to associate a Portfolio ID with interlacing Pairs orders, so the Pairs algorithm will know that all subsequent orders with the Portfolio ID provided are part of this pair. Beware that if you send additional pairs using the same string, you may be sending more than two orders as part of a pair. In this case, the orders will be rejected. This is not often used, but may be useful for FIX clients who work with order streams.

Trading Algorithm Definition – PAIRS (cont'd)

- Risk and Control
  - Trigger method and Trigger Ratio are mandatory parameters and need to be provided by User. Otherwise the order will be rejected
  - Trigger Direction is based on trigger method
    - If Ratio (Sell / Buy) is chosen it should be always "Greater Than or Equal To"
    - If Ratio (Buy / Sell) is chosen it should be always "Lesser Than or Equal To"
    - If user set otherwise the pair will be rejected
  - Ratio has to be +ve. Otherwise the pair will be rejected
    - i.e. Algo will only allow to buy lesser than or equal to sold price
  - If one leg has market trading restrictions (example - Hong Kong Short), algo will always initiate the first trade on the restricted leg, and catch up for equivalent shares on the other leg
  - Further details on platform checks and price controls can be found in Appendix B

- Things to watch
  - If trading conditions don't allow the Pairs strategy to take on both sides and stay within the ratio (like above case), then Pairs strategy could provide liquidity on one side at an acceptable price and then take liquidity on the other side.
  - But if the market moves away, before we could trade other leg (once it has legged), the strategy will stop trading regardless of the trigger value evaluation until the strategy can catch up on the other side.
    - i.e. if we sold 500 shares on sell leg and before algo could buy the equivalent shares for buy leg, market moved away, now the algo is legged. Algo will now STOP trading sell leg, irrespective of trigger evaluation. Only when the buy shares (equivalent to 500 sell shares) are traded, algo will start trigger evaluation again
  - The execution style does not affect pricing.
    - Pairs will use whatever prices are available that meet the criteria for the pair to trade without exceeding specified limits. The size of shares, Pairs will provide/take on the leg-in side is more conservative with a passive execution style. The style setting does not affect reloading with the Pairs strategy
  - The Max Part Rate constraint can be used to alter Pairs behavior to tilt more toward liquidity providing over liquidity taking. If the strategy finds itself getting close to the Max Part Rate, it will turn off liquidity taking, even when in range.
  - The Pairs strategy can either use dynamic or static foreign exchange rates for a multi-currency pair. By default, the Pairs strategy uses dynamic exchange rates

Trading Algorithm Definition – Expert Trade Automation [ETA]

- Trading Characteristics and execution behavior
  - ETA provides traders with the ability to switch from one strategy to another when one or two trigger conditions have been met. Traders can choose an initial strategy, trigger conditions, and an alternate strategy with associated parameters such as Style and Participation Rate

- Parameters
  - Initial Strategy
    - The Initial Strategy is run at order arrival time
  - Alternate Strategy
    - The Initial Strategy is run at order arrival time
  - Trigger Direction
    - The “Trigger Direction” indicates whether ETA should switch from the Initial to the Alternate strategy once only (One Way), or should it also switch from the Alternate strategy *back* to the Initial strategy when trigger conditions are met (Two Way)
  - Trigger Options
    - One or two triggers may be set to indicate when the Initial Strategy should be replaced by the Alternate Strategy
    - The two triggers can be combined using “OR” or “AND” to indicate whether just one or both of the two triggers must be fired before the Alternate Strategy is run
    - Depending on the selected Trigger Type, an Operator and Trigger Value must be set so that the trigger can be evaluated. Different operators are available depending on the Trigger Type. The Trigger Value units also depend on the Trigger Type

Trading Algorithm Definition – Expert Trade Automation [ETA] (cont'd)

- Trigger Options (cont'd)

Trigger Type	Description	Supported Operators	Value Units
Mkt Volume (%)	Ratio of current to historical volume. Values greater than or less than 100 indicates heavier or lighter volume than usual respectively. Calculation begins 15 minutes after order arrival	Greater Than, Less Than	Percent
Order Residual (%)	Percent of order quantity left unexecuted	Greater Than, Less Than	Percent
Price Level	The current mid-price if the reference security is a stock. The last price if the reference security is an index	Better, Worse	Currency
Relative Return	Return relative to the default floating limit symbol (or to the Relative Symbol associated with the Relative Limit on the ticket, if specified), from the order start to the current time	Better, Worse	Basis Points
Straight Return	Return from the mid-price at order start-time to the current mid-price	Better, Worse	Basis Points
Time	*Relative* time triggers (e.g., minutes after the open, or before the order end time)	After Open, After Start Time, Before Close, Before End Time	Minutes
VWAP Relative	Ratio of the difference between the current mid-price [M] and interval VWAP [iVWAP] (from order start time) as a proportion of the interval VWAP price ((M-iVWAP) / iVWAP) * 10000	Better, Worse	Basis Points

Trading Algorithm Definition – Expert Trade Automation [ETA] (cont'd)

- Examples:
  - Triggers

Trigger Type	When it fires
Mkt Volume, Greater Than, 120	When current volume is 120% of historical volume
Order Residual, Less Than, 80	When less than 80% of the order is left
Price Level, Better, 101	When the mid-price is less than 101 if buying, or greater than 101 if selling
Relative Return, Better, 150	When the relative return is less than -150 bps if buying, or greater than 150 bps if selling
Straight Return, Worse, 150	When the return is greater than 150 bps if buying, or less than -150 bps if selling
Time, After Open, 20	When the current time is at least 20 minutes after the market open time
Time, Before Close, 20	When the current time is within 20 minutes of the market closing time

- Examples:
  - Multiple Triggers

Trigger Type	When it fires
Mkt Volume, Greater Than 120 AND Time, After Open, 20	When current volume is 120% of historical volume AND the current time is at least 20 minutes after the market open time
Order Residual, Greater Than 80 AND Time, Before Close, 20	When greater than 80% of the order is left AND the current time is within 20 minutes of the market closing time
VWAP Relative, Better 10 OR VWAP Relative, Worse, 10	When the mid-price deviates from VWAP by 10 bps

Trading Algorithm Definition – Expert Trade Automation [ETA] (cont'd)

- Risk and Control
  - Comprehensive pre-trade and ongoing validation options, available which are supported by Instinet Execution Experts
  - Further details on platform checks and price controls can be found in Appendix B

- Things to watch
  - If Trigger Direction "Two Way" is selected ("One Way" is the default), then the Alternate strategy must not be one of CANCEL, Route to Desk, or SMRT, otherwise the order will be rejected. The Alternate strategy must be something that ETA can reasonably be expected to revert back from
  - ETA does not participate in any auctions

Trading Algorithm Definition - VWAP

- Trading Characteristics and execution behavior
  - Trade against the volume-weighted average price over the specified trading horizon. Trajectories are primarily based on a blend of 15, 30 and 60 day median profiles. The order is executed in line with the trajectory with varying degrees of leeway that is controlled by the “Style” setting. This means the strategy is slightly less “scheduled” than competing offerings and gives us flexibility to be more tactical with sizing and timing of orders. In addition to representing the flow on the lit markets, some quantity is handed to the Nighthawk liquidity aggregator. By this method, the VWAP strategy has access to a large number of liquidity pools in which it will try and find price improvement as the trade progresses. For Japan, the VWAP algorithm can be linked to Instinet’s “Nighthawk VWAP” aggregator, which cleanly aggregates eight pre-market, full-day VWAP crosses (three Instinet, three Nomura, two SBI) and to PM VWAP Cross. Any residual balance after the crosses are struck is handled by the algorithm as described above. Any balance after the cross is struck is handled by the algorithm as described above.
- Available Parameters

Field	Behaviour
Start Time	Configure a start time for the algorithm. The default is the later of the point of order arrival and the open
End Time	Configure an end time for the algorithm. The default is the end of the continuous trading period
Style	The style parameter is used to control how tightly the algorithm tracks the historical profile. Generally, the tighter the schedule is tracked, the less freedom the strategy has to search for liquidity at other venues. Style options are ▪ ***Passive Only*** **–** no aggressive submissions. Liquidity provision only, both to lit venues and to dark venues using a primary peg ▪ ***Dormant*** ▪ ***Passive*** ▪ ***Normal*** ▪ ***Aggressive*** ▪ ***Super-Aggressive*** ▪ ***Aggressive-Only*** **–** no passive submissions. Crossing spread only.
Floating Limit Type	See slide 12 for available floating limit types
Floating Limit Bps	Add an offset for the floating limit in basis points

Trading Algorithm Definition – VWAP (cont'd)

Field	Behaviour
Max Rate %	Add a max participation rate cap to the order (default is 35%)
Strict Max Part Rate	Strictly follow the max participation rate by only considering the traded market volume but not the near touch liquidity when it tries to send out passive submissions
Historical Max Part Rate	Add a max participation rate cap based on historical volume to the order (default is 0% i.e. not applied)
Block Exclusion	Defines the size of block trades beyond which, those trade blocks will be ignored in volume calculation by Algo. i.e Any trades above the specified Block Exclusion Value will be excluded
Auction Type	Determines whether or not the algorithm will participate in any scheduled auctions. Options are: ▪ ***OPEN*** **–** just participate in the opening auction ▪ ***CLOSE*** **–** just participate in the closing auction ▪ ***ALL*** **–** participate in all scheduled auctions ▪ ***NONE*** **–** don't participate in any scheduled auctions
Open Auction Override	Allows a user-specified override for the percentage of order to target for open auction, if applicable
Noon Auction Override	Allows a user-specified override for the percentage of order to target for noon auction, if applicable
Close Auction Override	Allows a user-specified override for the percentage of order to target for close auction, if applicable
Duration	Define a number of minutes as the execution horizon of the order. This is used in conjunction with the Time Basis field to allow an alternative to setting a start time or an end time. This is useful when sending orders across multiple time zones.
Time Basis	Used in conjunction with the Duration parameter. Set a trading window around points in the day rather than using the start time and end time parameters ▪ ***OPEN*** **–** Start working the order at (or in, if configured) the opening auction and work it for the number of minutes defined in the "Duration" field ▪ ***CLOSE*** **–** Aim to complete the order at (or in, if configured) the closing auction and work backwards from there by "Duration" minutes to calculate the start time. *NB: if Time Basis and Duration conflict with the Start Time and End Time parameters the Time Basis and Duration will take priority*
Full Day VWAP Cross	determine whether VWAP orders can be placed into the pre-market VWAP cross aggregators in Japan (Nighthawk VWAP)
PM VWAP Cross	determine whether VWAP orders can be placed into the lunch break VWAP cross aggregators in Japan (Nighthawk VWAP)

Trading Algorithm Definition – VWAP (cont'd)

Field	Behaviour
Complete at Limit Up / Down	Determine whether or not to send out all the remaining shares when Best Bid = Limit Down (Best Ask = Limit Up for Sell)
Enable Day Hi/Low Price Validation	Determines whether or not to limit the algorithm by the Day High / Low Price. Options are: ▪ ***Always On*** **–** always apply the Day High / Low Price Limits ▪ ***On Until Finish Up*** **–** apply the Day High / Low Price Limits until the algorithm tries to finish the order ▪ ***NONE*** **–** don't apply the Day High / Low Price Limits
I Would Price	Define a price level at which the algorithm enters "I Would" mode. The algorithm's aim becomes to complete the order, or as much of it as possible, at this level. The max part rate constraint does not apply during periods where the price is at or better than the "I Would" price
I Would Px Qty Allocation	Define a percentage of the order / Number of shares to be completed by "I Would"
I Would Px Qty Allocation Type	Define the unit of I Would Px Qty Allocation. Options are: ▪ ***Number of Shares*** **–** I Would Px Qty Allocation is specified in number of shares ▪ ***Percent*** **–** I Would Px Qty Allocation is specified in percent of the order
Nighthawk Allocation %	Define a percentage of the order to be handled by Nighthawk over and above standard dark pool interaction in VWAP. For example if 20% is entered, VWAP will work the order as normal but give 20% of the quantity to Nighthawk to try and find block liquidity with in the meantime.
Nighthawk Limit Price	Define a separate, additional limit price for the Nighthawk Allocation percentage piece of the order
Max Dark Exposure	Configure a maximum quantity of the Nighthawk Allocation percentage that can be exposed to dark venues at any one time
Min Dark Fill	Define a minimum acceptable fill size to all venues that support it.
Use Composite Volume	Set a flag to instruct VWAP to consider the volume from available alternate venues (e.g. CHIX) when applying the Max Participation Rate
Use Dark Liquidity	Instruct VWAP to suppress all interaction with off-exchange venues during its normal operation
Schedule Adjustment (second)	Define how far to look ahead the historical volume profile (in seconds) to determine how much to be exposed passively
Secondary Limit	See slide 13 for Secondary Limit trading behavior

Trading Algorithm Definition – VWAP (cont'd)

- Risk and Control
  - Instinet has a default set of cap limit checks applicable per-slice and price range checks which vary per market. These and other limits can be customized based on individual client requirements
  - Recommendations would include orders greater than a certain percentage of ADV, limit prices more aggressive than a certain percentage through the current far touch, order size or value greater than a specified amount, etc. We are happy to work with clients on any custom checks they wish to put in place for their flow
  - For orders with high participation rate (100%) orders, if algo calculated required finish up rate is more than 40%, Experts would pause the order with notification to review the order. The trader can review the price controls and order can be released if the order has been set with appropriate parameters (example hard limit or 3% relative limit referencing an index)
  - Further details on platform checks and price controls can be found in Appendix B
- Things to watch
  - High max participation rate settings with large orders and small remaining time horizons could encourage the algorithm to act aggressively with respect to the stock resulting in potentially adverse price movements
  - Auction settings for markets without real-time indicative volume information, such as Indonesia where the auction is blind, will be based on historical profile data. If the actual auction is light versus historical data it is possible that a disproportionately large auction slice will be released
  - If the Duration and Time Basis parameters are configured as well as Start Time and End Time and the values conflict, the Duration and Time Basis parameters will take priority
  - Liquidity in the market allowing, it is most likely that orders will complete. There are price protection mechanisms that are designed to prevent the algorithm from moving a stock a significant amount (see Appendix B). If the order is large and the timeframe is short it is possible that these constraints, which are necessary from the regulator's perspective to help maintain a fair and orderly market, will be activated. This may result in a residual

Trading Algorithm Definition – Target Close

- Trading Characteristics and execution behavior

  - Target Close will assess the size of the order relative to historical norms and decide if the closing auction period alone is sufficient to execute the order without material impact. If not, the algorithm uses a risk-cost optimization similar to an IS strategy to compute an effective start time for the order. The algorithm then works the order into the closing period leaving as much for the closing period itself as it can in accordance with its calculation. Target Close is also linked to Instinet's MOC cross for Hong Kong orders. Interaction with the cross is at the client's discretion and can be enabled, disabled or defaulted as required.

- Available Parameters

Field	Behaviour
Start Time	Configure a start time for the algorithm. The default is the start time calculated by the algorithm but this can be overridden if necessary
End Time	Configure an end time for the algorithm. Given the nature of the strategy the default is the end of the continuous trading period including any scheduled closing auction phase
Style	For orders that will not complete in the closing auction phase alone, the Style parameter is used to control how tightly the algorithm tracks the calculated trajectory. Generally, the tighter the schedule is tracked, the less freedom the strategy has to search for liquidity at other venues. Style options are ▪ ***Passive Only*** **–** no aggressive submissions. Liquidity provision only, both to lit venues and to dark venues using a primary peg ▪ ***Passive*** ▪ ***Normal*** ▪ ***Aggressive*** ▪ ***Super-Aggressive*** ▪ ***Aggressive-Only*** **–** no passive submissions. Crossing spread only.
Floating Limit Type	See slide 12 for available floating limit types
Floating Limit Bps	Add an offset for the floating limit in basis points

Trading Algorithm Definition – Target Close (cont'd)

Field	Behaviour
Auction Type	Determines whether or not the algorithm will participate in any auctions. Options are: ▪ ***CLOSE*** – just participate in the closing auction (default) ▪ ***NONE*** – don't participate in any scheduled auctions
Max Part Rate	Add a max participation rate cap to the order (default is 35%)
Auction Max Part Rate	Add a max participation rate override only applicable for closing auction (default is none. Use the Max Part Rate)
I Would Price	Define a price level at which the algorithm enters "I Would" mode. The algorithm's aim becomes to complete the order, or as much of it as possible, at this level. The historical schedule and max rate constraints do not apply during periods where the price is at or better than the "I Would" price
Auction Max from Last(Bps)	Submits to the auction with a limit price constraint from the last traded price +/- the % offset specified (depending on side).
Continuous Target Rate	Define the target percentage of the expected continuous volume used for estimation of continuous start time by the Strategy.
Auction Target Rate	Define the target percentage of the expected auction volume used for estimation by the Strategy.
Min Auction Sizing	The user may supply a Minimum collar (as % of ADV or % of Order…) value which will help the Strategy to calculate the close auction submission sizing.
Max Auction Sizing	The user may supply a Maximum collar (as % of ADV or % of Order…) value which will help the Strategy to calculate the close auction submission sizing.
Use Composite Volume	Set a flag to instruct TargetClose to consider the volume from available alternate venues (e.g. CHIX) when applying the Max Participation Rate
Use Dark Liquidity	Instruct TargetClose to suppress all interaction with off-exchange venues during its normal operation
Close Cross Eligible	determine whether Target Close orders can be placed into the Instinet Hong Kong / Australia MOC Cross
Secondary Limit	See slide 13 for Secondary Limit trading behavior
Block Exclusion	Defines the size of block trades beyond which, those trade blocks will be ignored in volume calculation by Algo. i.e. Any trades above the specified Block Exclusion Value will be excluded

Trading Algorithm Definition – Target Close (cont'd)

- Risk and Control
  - Instinet has a default set of cap limit checks applicable per-slice and price range checks which vary per market. These and other limits can be customised based on individual client requirements
  - Recommendations would include orders greater than a certain percentage of ADV, limit prices more aggressive than a certain percentage through the current far touch, order size or value greater than a specified amount, etc. We are happy to work with clients on any custom checks they wish to put in place for their flow
  - In case of connect orders, traders have to input the "Auction Target Rate" as equal or below 20%, otherwise the order would be rejected.
  - Further details on platform checks and price controls can be found in Appendix B
- Things to watch
  - As per the VWAP implementation the order is executed in line with the algorithm's calculated trajectory where the anticipated closing auction volume is insufficient to complete the order. In addition to representing the flow on the lit markets, some quantity is handed to the Nighthawk liquidity aggregator. By this method, the Target Close strategy has access to a large number of liquidity pools in which it will try and find price improvement and minimise its impact in the run-up to the auction or closing period
  - Auction settings for markets without real-time indicative volume information, such as Indonesia where the auction is blind, will be based on historical profile data. If the actual auction is light versus historical data it is possible that a disproportionately large auction slice will be released
  - If a fill is received early from the Instinet Hong Kong MOC cross then this is tantamount to that part of the order being completed. It is possible to cancel the balance, if any, at any time, but cross fills will stand. Outside of this, orders can be cancelled and amended at any time
  - Liquidity in the market allowing, it is most likely that orders will complete. There are price protection mechanisms that are designed to prevent the algorithm from moving a stock a significant amount (see Appendix B). If the order is large and the timeframe is short it is possible that these constraints, which are necessary from the regulator's perspective to help maintain a fair and orderly market, will be activated. This may result in a residual

Trading Algorithm Definition - TWAP

- Trading Characteristics and execution behaviour
  - Trade against the time-weighted average price over the specified trading horizon. Trajectories are calculated as a straight line between the start time and the end time. The order is executed in line with the straight-line trajectory with varying degrees of leeway as controlled by the “Style” setting. This means the strategy is slightly less “scheduled” than competing offerings and gives us flexibility to be more tactical with sizing and timing of orders. Similar to VWAP, in addition to representing the flow on the lit markets, some quantity can be handed to the Nighthawk liquidity aggregator. By this method, the TWAP strategy has access to a large number of liquidity pools in which it will try and find price improvement as the trade progresses.
- Available Parameters

Field	Behaviour
Start Time	Configure a start time for the algorithm. The default is the later of the point of order arrival and the open
End Time	Configure an end time for the algorithm. The default is the end of the continuous trading period
Style	The style parameter is used to control how tightly the algorithm tracks the profile. Generally, the tighter the schedule is tracked, the less freedom the strategy has to search for liquidity at other venues. Style options are ▪ ***Passive Only*** **–** no aggressive submissions. Liquidity provision only, both to lit venues and to dark venues using a primary peg ▪ ***Dormant*** ▪ ***Passive*** ▪ ***Normal*** ▪ ***Aggressive*** ▪ ***Super-Aggressive*** ▪ ***Aggressive-Only*** **–** no passive submissions. Crossing spread only.
Floating Limit Type	See slide 12 for available floating limit types
Floating Limit Bps	Add an offset for the floating limit in basis points

Trading Algorithm Definition – TWAP (cont'd)

Field	Behaviour
Max Rate %	Add a max participation rate cap to the order (default is 35%)
Block Exclusion	Defines the size of block trades beyond which, those trade blocks will be ignored in volume calculation by Algo. i.e Any trades above the specified Block Exclusion Value will be excluded
Strict Max Part Rate	Strictly follow the max participation rate by only considering the traded market volume but not the near touch liquidity when it tries to send out passive submissions
Historical Max Part Rate	Add a max participation rate cap based on historical volume to the order (default is 0% i.e. not applied)
Auction Type	Determines whether or not the algorithm will participate in any auctions. Options are: ▪ ***OPEN*** **–** just participate in the opening auction ▪ ***CLOSE*** **–** just participate in the closing auction ▪ ***ALL*** **–** participate in all scheduled auctions ▪ ***NONE*** **–** don't participate in any scheduled auctions
Open Auction Override	Allows a user-specified override for the percentage of order to target for open auction, if applicable
Noon Auction Override	Allows a user-specified override for the percentage of order to target for noon auction, if applicable
Close Auction Override	Allows a user-specified override for the percentage of order to target for close auction, if applicable
Duration	Define a number of minutes as the execution horizon of the order. This is used in conjunction with the Time Basis field to allow an alternative to setting a start time or an end time. This is useful when sending orders across multiple time zones.
Time Basis	Used in conjunction with the Duration parameter. Set a trading window around points in the day rather than using the start time and end time parameters ▪ ***OPEN*** **–** Start working the order at (or in, if configured) the opening auction and work it for the number of minutes defined in the "Duration" field ▪ ***CLOSE*** **–** Aim to complete the order at (or in, if configured) the closing auction and work backwards from there by "Duration" minutes to calculate the start time. *NB: if Time Basis and Duration conflict with the Start Time and End Time parameters the Time Basis and Duration will take priority*
Complete at Limit Up / Down	Determine whether or not to send out all the remaining shares when Best Bid = Limit Down (Best Ask = Limit Up for Sell)

Trading Algorithm Definition – TWAP (cont'd)

Field	Behaviour
Enable Day Hi/Low Price Validation	Determines whether or not to limit the algorithm by the Day High / Low Price. Options are: ▪ ***Always On*** – always apply the Day High / Low Price Limits ▪ ***On Until Finish Up*** – apply the Day High / Low Price Limits until the algorithm tries to finish the order ▪ ***NONE*** – don't apply the Day High / Low Price Limits
I Would Price	Define a price level at which the algorithm enters "I Would" mode. The algorithm's aim becomes to complete the order, or as much of it as possible, at this level. The max part rate constraint does not apply during periods where the price is at or better than the "I Would" price
I Would Px Qty Allocation	Define a percentage of the order / Number of shares to be completed by "I Would"
I Would Px Qty Allocation Type	Define the unit of I Would Px Qty Allocation. Options are: ▪ ***Number of Shares*** – I Would Px Qty Allocation is specified in number of shares ▪ ***Percent*** – I Would Px Qty Allocation is specified in percent of the order
Nighthawk Allocation %	Define a percentage of the order to be handled by Nighthawk over and above standard dark pool interaction in TWAP. For example if 20% is entered, TWAP will work the order as normal but give 20% of the quantity to Nighthawk to try and find block liquidity with in the meantime.
Nighthawk Limit Price	Define a separate, additional limit price for the Nighthawk Allocation percentage piece of the order
Max Dark Exposure	Configure a maximum quantity of the Nighthawk Allocation percentage that can be exposed to dark venues at any one time
Min Dark Fill	Define a minimum acceptable fill size to all venues that support it.
Use Composite Volume	Set a flag to instruct TWAP to consider the volume from available alternate venues (e.g. CHIX) when applying the Max Participation Rate
Use Dark Liquidity	Instruct TWAP to suppress all interaction with off-exchange venues during its normal operation
Schedule Adjustment (seconds)	Define how far to look ahead the historical volume profile (in seconds) to determine how much to be exposed passively
Strict Bucket Time	Force TWAP to catch up to the trading profile on a fixed interval (in seconds)
Strict Bucket Shares	Force TWAP to catch up for a fixed amount of shares in every trading schedule update
Secondary Limit	See slide 13 for Secondary Limit trading behavior

Trading Algorithm Definition – TWAP (cont'd)

- Risk and Control
  - Instinet has a default set of cap limit checks applicable per-slice and price range checks which vary per market. These and other limits can be customized based on individual client requirements
  - Recommendations would include orders greater than a certain percentage of ADV, limit prices more aggressive than a certain percentage through the current far touch, order size or value greater than a specified amount, etc. We are happy to work with clients on any custom checks they wish to put in place for their flow
  - For orders with high participation rate (100%) orders, if algo calculated required finish up rate is more than 40%, Experts would pause the order with notification to review the order. The trader can review the price controls and order can be released if the order has been set with appropriate parameters (example hard limit or 3% relative limit referencing an index)
  - Further details on platform checks and price controls can be found in Appendix B
- Things to watch
  - High max participation rate settings with large orders and small remaining time horizons could encourage the algorithm to act aggressively with respect to the stock resulting in potentially adverse price movements
  - Auction settings for markets without real-time indicative volume information, such as Indonesia where the auction is blind, will be based on historical profile data. If the actual auction is light versus historical data it is possible that a disproportionately large auction slice will be released
  - If the Duration and Time Basis parameters are configured as well as Start Time and End Time and the values conflict, the Duration and Time Basis parameters will take priority
  - Liquidity in the market allowing, it is most likely that orders will complete. There are price protection mechanisms that are designed to prevent the algorithm from moving a stock a significant amount (see Appendix B). If the order is large and the timeframe is short it is possible that these constraints, which are necessary from the regulator's perspective to help maintain a fair and orderly market, will be activated. This may result in a residual

Trading Algorithm Definition – Target Open

- Trading Characteristics and execution behaviour
  - Target Open will assess the size of the order relative to historical norms and decide if the opening auction period alone is sufficient to execute the order without material impact. If not, the algorithm uses a risk-cost optimization similar to an IS strategy to compute an effective end time for the order. The algorithm then works the post-open residual of the order in a similar manner to an IS strategy, aiming to complete by the calculated end time. As with all the core strategies of the Experts® suite, the standard operation of Target Open is complemented by optional dark venue interaction via the dark aggregation logic contained in Instinet's Nighthawk® aggregation algorithm.

- Available Parameters

Field	Behaviour
Start Time	Configure a start time for the algorithm. The default is the start of continuous trading, including any opening auction period
End Time	Configure an end time for the algorithm. The default is the end time calculated by the algorithm
Style	The style parameter is used to control how tightly the algorithm tracks the profile. Generally, the tighter the schedule is tracked, the less freedom the strategy has to search for liquidity at other venues. Style options are ▪ ***Strict*** ▪ ***Normal*** ▪ ***Opportunistic***
Auction Type	Determines whether or not the algorithm will participate in any auctions. Options are: ▪ ***OPEN*** – just participate in the opening auction (default) ▪ ***CLOSE*** – just participate in the closing auction ▪ ***ALL*** – participate in all scheduled auctions ▪ ***NONE*** – don't participate in any scheduled auctions
Floating Limit Type	See slide 12 for available floating limit types
Floating Limit Bps	Add an offset for the floating limit in basis points

Trading Algorithm Definition – Target Open (cont'd)

Field	Behaviour
Max Part Rate	Add a max participation rate cap to the order (default is 35%)
Enable Day Hi/Low Price Validation	Determines whether or not to limit the algorithm by the Day High / Low Price. Options are: ▪ ***Always On*** **–** always apply the Day High / Low Price Limits ▪ ***On Until Finish Up*** **–** apply the Day High / Low Price Limits until the algorithm tries to finish the order ▪ ***NONE*** **–** don't apply the Day High / Low Price Limits
I Would Price	Define a price level at which the algorithm enters "I Would" mode. The algorithm's aim becomes to complete the order, or as much of it as possible, at this level. The max part rate constraint does not apply during periods where the price is at or better than the "I Would" price
I Would Px Qty Allocation	Define a percentage of the order / Number of shares to be completed by "I Would"
I Would Px Qty Allocation Type	Define the unit of I Would Px Qty Allocation. Options are: ▪ ***Number of Shares*** **–** I Would Px Qty Allocation is specified in number of shares ▪ ***Percent*** **–** I Would Px Qty Allocation is specified in percent of the order
Nighthawk Allocation %	Define a percentage of the order to be handled by Nighthawk over and above standard dark pool interaction in TargetOpen. For example if 20% is entered, TargetOpen will work the order as normal but give 20% of the quantity to Nighthawk to try and find block liquidity with in the meantime.
Nighthawk Limit Price	Define a separate, additional limit price for the Nighthawk Allocation percentage piece of the order
Max Dark Exposure	Configure a maximum quantity of the Nighthawk Allocation percentage that can be exposed to dark venues at any one time
Min Dark Fill	Define a minimum acceptable fill size to all venues that support it.
Use Composite Volume	Set a flag to instruct TargetOpen to consider the volume from available alternate venues (e.g. CHIX) when applying the Max Participation Rate
Use Dark Liquidity	Instruct TargetOpen to suppress all interaction with off-exchange venues during its normal operation
Auction Max from PNC (bps)	Specify the maximum offset from PNC at which to limit an open auction submission. By default this parameter is not applied
Secondary Limit	See slide 13 for Secondary Limit trading behavior
Block Exclusion	Defines the size of block trades beyond which, those trade blocks will be ignored in volume calculation by Algo. i.e Any trades above the specified Block Exclusion Value will be excluded

Trading Algorithm Definition – Target Open (cont'd)

- Risk and Control
  - Instinet has a default set of cap limit checks applicable per-slice and price range checks which vary per market. These and other limits can be customised based on individual client requirements
  - Recommendations would include orders greater than a certain percentage of ADV, limit prices more aggressive than a certain percentage through the current far touch, order size or value greater than a specified amount, etc. We are happy to work with clients on any custom checks they wish to put in place for their flow
  - Further details on platform checks and price controls can be found in Appendix B

- Things to watch
  - Orders that require more than just the opening auction to complete will be executed in line with a risk versus cost optimisation similar to an IS-type strategy. In addition to representing the flow on the lit markets, when there is leeway around the trajectory some quantity is handed to the Nighthawk liquidity aggregator. By this method, the Target Open strategy has access to a large number of liquidity pools in which it will try and find price improvement and minimise its impact in the continuous trading period
  - Auction settings for markets without real-time indicative volume information, such as Indonesia where the auction is blind, will be based on historical profile data. If the actual auction is light versus historical data it is possible that a disproportionately large auction slice will be released

Trading Algorithm Definition – IS

- Trading Characteristics and execution behaviour
  - IS is a risk-cost optimisation algorithm most often used as a solution to the Arrival Price trading benchmark. The strategy aims to calculate the optimum trading horizon based on the optimisation of the tradeoff between price impact and opportunity cost for a predetermined attitude to risk. The attitude to risk is encapsulated in the style parameter, where the more aggressive the style setting the more adverse the attitude to price risk. The effect of choosing a more aggressive style is that in all likelihood the trade's duration decreases and potentially incurs more impact to lessen dispersion. As with all the core strategies of the Experts® suite, the standard operation of IS is complemented by optional dark venue interaction via the dark aggregation logic contained in Instinet's Nighthawk® aggregation algorithm.

- Available Parameters

Field	Behaviour
Start Time	Configure a start time for the algorithm. The default is the later of the point of arrival and the start of continuous trading, including any opening auction period
End Time	Configure an end time for the algorithm. The default is the end time calculated by the algorithm
Time Basis	Used in conjunction with the Duration parameter. Set a trading window around points in the day rather than using the start time and end time parameters ▪ ***OPEN –*** Start working the order at (or in, if configured) the opening auction and work it for the number of minutes defined in the "Duration" field ▪ ***CLOSE –*** Aim to complete the order at (or in, if configured) the closing auction and work backwards from there by "Duration" minutes to calculate the start time. *NB: if Time Basis and Duration conflict with the Start Time and End Time parameters the Time Basis and Duration will take priority*
Duration	Define a number of minutes as the execution horizon of the order. This is used in conjunction with the Time Basis field to allow an alternative to setting a start time or an end time. This is useful when sending orders across multiple time zones

Trading Algorithm Definition – IS (cont'd)

Field	Behaviour
Style	The style parameter is used to control how tightly the algorithm tracks the IS trajectory. Generally, the tighter the trajectory is tracked, the less freedom the strategy has to search for liquidity at other venues. Style options are: ▪ ***Strict*** ▪ ***Normal*** ▪ ***Opportunistic***
Auction Type	Determines whether or not the algorithm will participate in any auctions. Options are: ▪ ***OPEN*** **–** just participate in the opening auction ▪ ***CLOSE*** **–** just participate in the closing auction ▪ ***ALL*** **–** participate in all scheduled auctions ▪ ***NONE*** **–** don't participate in any scheduled auctions
Max Part Rate	Add a max participation rate cap to the order (default is 35%)
I Would Price	Define a price level at which the algorithm enters "I Would" mode. The algorithm's aim becomes to complete the order, or as much of it as possible, at this level. The historical schedule and max rate constraints do not apply during periods where the price is at or better than the "I Would" price
Floating Limit Type	See slide 12 for available floating limit types (default is none)
Floating Limit Offset (Bps)	Apply a floating limit offset in basis points to the selected Floating Limit Type
Nighthawk Allocation %	Define a percentage of the order to be handled by Nighthawk over and above standard dark pool interaction in IS. For example if 20% is entered, IS will work the order as normal but give 20% of the quantity to Nighthawk to try and find block liquidity with in the meantime.
Nighthawk Limit Price	Define a separate, additional limit price for the Nighthawk Allocation percentage piece of the order
Max Dark Exposure (%/shrs)	Configure a maximum quantity of the Nighthawk Allocation percentage that can be exposed to dark venues at any one time
Min Dark Fill	Define a minimum acceptable fill size to all venues that support it.
Block Exclusion	Defines the size of block trades beyond which, those trade blocks will be ignored in volume calculation by Algo. i.e Any trades above the specified Block Exclusion Value will be excluded
Secondary Limit	See slide 13 for Secondary Limit trading behavior

Trading Algorithm Definition – IS (cont'd)

- Risk and Control
  - Instinet has a default set of cap limit checks applicable per-slice and price range checks which vary per market. These and other limits can be customized based on individual client requirements
  - Recommendations would include orders greater than a certain percentage of ADV, limit prices more aggressive than a certain percentage through the current far touch, order size or value greater than a specified amount, etc. We are happy to work with clients on any custom checks they wish to put in place for their flow
  - The aggressive styles of IS take a price risk averse approach to the optimization. This can lead to orders trading quite quickly after submission. Orders sent to the Super-Aggressive style of IS must be supplied with a firm limit price (max of 3% or 3 ticks from last).
  - Further details on platform checks and price controls can be found in Appendix B

- Things to watch
  - There is no automatic increase in trading activity when the price becomes favorable relative to the arrival price

Trading Algorithm Definition - TEN

- Trading Characteristics and execution behaviour
  - Instinet's multi-benchmark strategy, TEN, allows users to optimally balance shortfall to three separate benchmarks: Arrival, VWAP and/or Departure price. The user provides a relative weighting between 0 and 10 per benchmark such that the total weightings sum to 10. The most frequent use of TEN is for a VWAP-benchmarked order with short-term alpha, achieved by adding an IS flavour to the execution. Alternative uses are for Implementation Shortfall orders where the user also cares about VWAP dispersion, or for tilting a trade towards the close by supplying a weighting for Departure price. As for other Experts® benchmark-driven, strategies the style parameter determines how strictly the algorithm attempts to adhere to the trajectory. The more opportunistically the algorithm can trade the greater the likelihood of price improvement versus the far touch. As with all the core strategies of the Experts® suite, the standard operation of TEN is complemented by optional dark venue interaction via the dark aggregation logic contained in Instinet's Nighthawk® aggregation algorithm.

- Available Parameters

Field	Behaviour
Start Time	Configure a start time for the algorithm. The default is the later of the time of arrival and the start of continuous trading, including any opening auction period
End Time	Configure an end time for the algorithm. The default is the end of continuous trading
Time Basis	Used in conjunction with the Duration parameter. Set a trading window around points in the day rather than using the start time and end time parameters ▪ ***OPEN –*** Start working the order at (or in, if configured) the opening auction and work it for the number of minutes defined in the "Duration" field ▪ ***CLOSE –*** Aim to complete the order at (or in, if configured) the closing auction and work backwards from there by "Duration" minutes to calculate the start time. *NB: if Time Basis and Duration conflict with the Start Time and End Time parameters the Time Basis and Duration will take priority*
Duration	Define a number of minutes as the execution horizon of the order. This is used in conjunction with the Time Basis field to allow an alternative to setting a start time or an end time. This is useful when sending orders across multiple time zones

Trading Algorithm Definition – TEN (cont'd)

Field	Behaviour
Arrival Price [0..10]	The relative weighting to be assigned to the Arrival benchmark
VWAP Price [0..10]	The relative weighting to be assigned to the VWAP benchmark
Departure Price [0..10]	The relative weighting to be assigned to the Departure benchmark
Style	The style parameter is used to control how tightly the algorithm tracks the trajectory. Generally, the tighter the trajectory is tracked, the less freedom the strategy has to search for liquidity at other venues. Style options are ▪ ***Strict*** ▪ ***Normal*** ▪ ***Opportunistic***
Max Part Rate	Add a max participation rate cap to the order (default is 35%)
Block Exclusion	Defines the size of block trades beyond which, those trade blocks will be ignored in volume calculation by Algo. i.e. Any trades above the specified Block Exclusion Value will be excluded
IWould Price	Define a price level at which the algorithm enters "I Would" mode. The algorithm's aim becomes to complete the order, or as much of it as possible, at this level. The historical schedule and max rate constraints do not apply during periods where the price is at or better than the "I Would" price
Auction Type	Determines whether or not the algorithm will participate in any auctions. Options are: ▪ ***OPEN*** – just participate in the opening auction ▪ ***CLOSE*** – just participate in the closing auction ▪ ***ALL*** – participate in all scheduled auctions (default) ▪ ***NONE*** – don't participate in any scheduled auctions
Use Dark Liquidity	Instruct TEN to suppress all interaction with off-exchange venues during its normal operation
Secondary Limit	See slide 13 for Secondary Limit trading behavior

Trading Algorithm Definition – TEN (cont'd)

Field	Behaviour
Nighthawk Allocation %	Define a percentage of the order to be handled by Nighthawk over and above standard dark pool interaction in TEN. For example if 20% is entered, TEN will work the order as normal but give 20% of the quantity to Nighthawk to try and find block liquidity with in the meantime.
Nighthawk Limit Price	Define a separate, additional limit price for the Nighthawk Allocation percentage piece of the order
Max Dark Exposure (%/shrs)	Configure a maximum quantity of the Nighthawk Allocation percentage that can be exposed to dark venues at any one time
Min Dark Fill	Define a minimum acceptable fill size to all venues that support it.
Floating Limit Type	See earlier slide for available floating limit types
Floating Limit Bps	Add an offset for the floating limit in basis points

Trading Algorithm Definition – TEN (cont'd)

- Risk and Control
  - Instinet has a default set of cap limit checks applicable per-slice and price range checks which vary per market. These and other limits can be customised based on individual client requirements
  - Recommendations would include orders greater than a certain percentage of ADV, limit prices more aggressive than a certain percentage through the current far touch, order size or value greater than a specified amount, etc. We are happy to work with clients on any custom checks they wish to put in place for their flow
  - Further details on platform checks and price controls can be found in Appendix B

- Things to Watch
  - High max participation rate settings with large orders and small remaining time horizons could encourage the algorithm to act aggressively with respect to the stock resulting in potentially adverse price movements
  - Auction settings for markets without real-time indicative volume information, such as Indonesia where the auction is blind, will be based on historical profile data. If the actual auction is light versus historical data it is possible that a disproportionately large auction slice will be released
  - If the Duration and Time Basis parameters are configured as well as Start Time and End Time and the values conflict, the Duration and Time Basis parameters will take priority
  - Liquidity in the market allowing, it is most likely that orders will complete. There are price protection mechanisms that are designed to prevent the algorithm from moving a stock a significant amount (see Appendix B). If the order is large and the timeframe is short it is possible that these constraints, which are necessary from the regulator's perspective to help maintain a fair and orderly market, will be activated. This may result in a residual
  - Orders with a significant Departure weighting are likely to have similar impact as a Target Close strategy. Users should be cautious of sending large orders over short time horizons near the end of the day
  - If the benchmark weightings supplied do not add up to ten, the order will be rejected

Trading Algorithm Definition – PART

- Trading Characteristics and execution behaviour
  - PART is Instinet's principal "in-line"-type strategy. Users supply a target percentage of the volume, which the algorithm will then try to match. Rather than being purely reactive, PART will use historical volume profiles in an attempt to gauge a sensible size to post passively so as to maximise the chance of spread saving during the trade. The main purpose is to attempt to reduce the number of aggressive submissions required to stay on target. The order is executed in line with the primary market volume (excluding cross prints on markets where such prints are allowed) with varying degrees of leeway that is controlled by the "Style" setting. The leeway allows PART to operate in off-exchange liquidity pools to try and find price improvement at the mid. In addition to representing the flow on the lit markets and operating in the dark when there is leeway against the target, some quantity can also be handed to Nighthawk. By this method, PART can run as a parent strategy, keeping on target while at the same time searching for blocks with a configurable additional size.

- Available Parameters

Field	Behaviour
Start Time	Configure a start time for the algorithm. The default is the later of the point of order arrival and the open
End Time	Configure an end time for the algorithm. The default is the end of the continuous trading period
Style	The style parameter is used to control how tightly the algorithm tracks the real-time market volume. Generally, the tighter the volume is tracked, the less freedom the strategy has to search for liquidity at other venues. Style options are ▪ ***Strict*** ▪ ***Normal*** ▪ ***Opportunistic***
Floating Limit Type	See earlier slide for available floating limit types
Floating Limit Bps	Add an offset for the floating limit in basis points
Max Rate %	Add a max participation rate cap to the order (default is 35%)
Target Part Rate	Specify the target participation rate that PART should aim to be
Min Part Rate	Specify a minimum participation rate that PART should not be able to drop below

Trading Algorithm Definition – PART (cont'd)

Field	Behaviour
Block Exclusion	Defines the size of block trades beyond which, those trade blocks will be ignored in volume calculation by Algo. i.e. Any trades above the specified Block Exclusion Value will be excluded
Auction Type	Determines whether or not the algorithm will participate in any auctions. Options are: ▪ ***OPEN*** **–** just participate in the opening auction ▪ ***CLOSE*** **–** just participate in the closing auction ▪ ***ALL*** **–** participate in all scheduled auctions (except Japan PM Close) ▪ ***NONE*** **–** don't participate in any scheduled auctions
Duration	Define a number of minutes as the execution horizon of the order. This is used in conjunction with the Time Basis field to allow an alternative to setting a start time or an end time. This is useful when sending orders across multiple time zones.
Time Basis	Used in conjunction with the Duration parameter. Set a trading window around points in the day rather than using the start time and end time parameters ▪ ***OPEN*** **–** Start working the order at (or in, if configured) the opening auction and work it for the number of minutes defined in the "Duration" field ▪ ***CLOSE*** **–** Aim to complete the order at (or in, if configured) the closing auction and work backwards from there by "Duration" minutes to calculate the start time. *NB: if Time Basis and Duration conflict with the Start Time and End Time parameters the Time Basis and Duration will take priority*
Enable Day Hi/Low Price Validation	Determines whether or not to limit the algorithm by the Day High / Low Price. Options are: ▪ ***Always On*** **–** always apply the Day High / Low Price Limits ▪ ***On Until Finish Up*** **–** apply the Day High / Low Price Limits until the algorithm tries to finish the order ▪ ***NONE*** **–** don't apply the Day High / Low Price Limits
Secondary Limit	See slide 13 for Secondary Limit trading behavior

Trading Algorithm Definition – PART (cont'd)

Field	Behaviour
I Would Price	Define a price level at which the algorithm enters "I Would" mode. The algorithm's aim becomes to complete the order, or as much of it as possible, at this level. The max part rate constraint does not apply during periods where the price is at or better than the "I Would" price
I Would Px Qty Allocation	Define a percentage of the order / Number of shares to be completed by "I Would"
I Would Px Qty Allocation Type	Define the unit of I Would Px Qty Allocation. Options are: ▪ ***Number of Shares*** **–** I Would Px Qty Allocation is specified in number of shares ▪ ***Percent*** **–** I Would Px Qty Allocation is specified in percent of the order
Nighthawk Allocation %	Define a percentage of the order to be handled by Nighthawk over and above standard dark pool interaction in PART. For example if 20% is entered, PART will work the order as normal but give 20% of the quantity to Nighthawk to try and find block liquidity with in the meantime.
Nighthawk Limit Price	Define a separate, additional limit price for the Nighthawk Allocation percentage piece of the order
Max Dark Exposure	Configure a maximum quantity of the Nighthawk Allocation percentage that can be exposed to dark venues at any one time
Min Dark Fill	Define a minimum acceptable fill size to all venues that support it.
Use Composite Volume	Set a flag to instruct PART to consider the volume from available alternate venues (e.g. CHIX) when applying the Max Participation Rate
Use Dark Liquidity	Instruct PART to suppress all interaction with off-exchange venues during its normal operation

Trading Algorithm Definition – PART (cont'd)

- Risk and Control
  - Instinet has a default set of cap limit checks applicable per-slice and price range checks which vary per market. These and other limits can be customized based on individual client requirements
  - Recommendations would include orders greater than a certain percentage of ADV, limit prices more aggressive than a certain percentage through the current far touch, order size or value greater than a specified amount, etc. We are happy to work with clients on any custom checks they wish to put in place for their flow
  - Further details on platform checks and price controls can be found in Appendix B
  - Given that at some point, aspects of participation-based strategies are likely to be reactive and respond to volume by crossing the spread, we have introduced changes that restrict how far away from the last traded price the most aggressive submission price can be for PART. At present we constrain to the least conservative of +4 ticks and +2% aggressive

- Things to watch
  - The highest permissible target participation rate is 75%. High levels have the potential to cause adverse price impact and be regarded as detrimental to the fairness and orderliness of the market
  - Auction settings for markets without real-time indicative volume information, such as Indonesia where the auction is blind, will be based on historical profile data and the target participation rate. If the actual auction is light versus historical data it is possible that a disproportionately large auction slice will be released
  - If the Duration and Time Basis parameters are configured as well as Start Time and End Time and the values conflict, the Duration and Time Basis parameters will take priority
  - The more opportunistic the style setting the more the short-term deviation from the target participation rate. Strict style more closely tracks the desired participation level, but may incur more price impact and signalling risk

Trading Algorithm Definition – DynaPART

- Trading Characteristics and execution behaviour
  - DynaPART is a PART derivative strategy that allows participation at various rates depending on the movement seen in the stock's price. It is possible to configure DynaPART to adjust its participation rate based on absolute return in the stock's price or the return relative to a secondary symbol, most frequently an index. The strategy allows for two modes of operation, Value and Momentum, which govern the way the actual participation rate is adjusted based on movement in the stock or index. Value mode will allow for an increase in participation rate when the stock moves in your favour and a reduction in participation rate as the stock moves against you. Momentum mode is the reverse of this: if the stock is moving in your favour the algorithm will reduce its participation rate so as not to hold up the move and if it's moving against you the algorithm will increase the rate. As with all the core strategies of the Experts® suite, the standard operation of DynaPART is complemented by optional dark venue interaction via the dark aggregation logic contained in Instinet's Nighthawk® aggregation algorithm.

- Available Parameters

Field	Behaviour
Start Time	Configure a start time for the algorithm. The default is the later of the time of arrival and the start of continuous trading, including any opening auction period
End Time	Configure an end time for the algorithm. The default is the end of continuous trading
Time Basis	Used in conjunction with the Duration parameter. Set a trading window around points in the day rather than using the start time and end time parameters ▪ ***OPEN –*** Start working the order at (or in, if configured) the opening auction and work it for the number of minutes defined in the "Duration" field ▪ ***CLOSE –*** Aim to complete the order at (or in, if configured) the closing auction and work backwards from there by "Duration" minutes to calculate the start time. *NB: if Time Basis and Duration conflict with the Start Time and End Time parameters the Time Basis and Duration will take priority*
Duration	Define a number of minutes as the execution horizon of the order. This is used in conjunction with the Time Basis field to allow an alternative to setting a start time or an end time. This is useful when sending orders across multiple time zones

Trading Algorithm Definition – DynaPART (cont'd)

Field	Behaviour
Target Part Rate	Specify the target participation rate that DynaPART should aim to be. Max allowable rate is 75%
Min Part Rate	Specify a minimum participation rate that DynaPART should not be able to drop below
Max Part Rate	Add a max participation rate cap to the order (default is 100%)
Use Straight Return	A flag that instructs DynaPART to use the straight return of the stock when determining whether or not to adjust the participation rate. The default is set to Yes. If changed to No, the strategy will use the supplied Dynamic Symbol and calculate a relative return against it. If no Dynamic Symbol is supplied the strategy will use the default index (see slide 12)
DynapartBps	The absolute or relative move in the stocks price in basis points that will trigger an adjustment in the target rate
DynapartPercent	The percentage factor applied to the initial Target Part Rate parameter to calculate the adjusted rate. For example, if the Target Part Rate is 20% and the Dynamic Percent is set as 10%, each rate adjustment is 10% of the original rate of 20%. A one-window increase in rate will take the Target Part Rate from 20% to 22%.
Dynamic Symbol	The reference symbol to be used when calculating relative return movements
Style	There are four mode-style combinations available for DynaPART: ▪ ***ValueNormal*** ▪ ***ValueAggressive*** ▪ ***MomentumNormal*** ▪ ***MomentumAggressive*** The more aggressive the style, the more tightly DynaPART will adhere to its Target Part Rate.
Auction Type	Determines whether or not the algorithm will participate in any auctions. Options are: ▪ ***OPEN*** – just participate in the opening auction ▪ ***CLOSE*** – just participate in the closing auction ▪ ***ALL*** – participate in all scheduled auctions (default, excluding Japan PM Close) ▪ ***NONE*** – don't participate in any scheduled auctions

Trading Algorithm Definition – DynaPART (cont'd)

Field	Behaviour
IWould Price	Define a price level at which the algorithm enters "I Would" mode. The algorithm's aim becomes to complete the order, or as much of it as possible, at this level. The historical schedule and max rate constraints do not apply during periods where the price is at or better than the "I Would" price
Floating Limit Type	See slide 12 for available floating limit types
Floating Limit Bps	Add an offset for the floating limit in basis points
Block Exclusion	Defines the size of block trades beyond which, those trade blocks will be ignored in volume calculation by Algo. i.e. Any trades above the specified Block Exclusion Value will be excluded
Use Dark Liquidity	Instruct DynaPART to suppress all interaction with off-exchange venues during its normal operation
Nighthawk Allocation %	Define a percentage of the order to be handled by Nighthawk over and above standard dark pool interaction in DynaPART. For example if 20% is entered, DynaPART will work the order as normal but give 20% of the quantity to Nighthawk to try and find block liquidity with in the meantime.
Nighthawk Limit Price	Define a separate, additional limit price for the Nighthawk Allocation percentage piece of the order
Max Dark Exposure	Configure a maximum quantity of the Nighthawk Allocation percentage that can be exposed to dark venues at any one time
Min Dark Fill	Define a minimum acceptable fill size to all venues that support it.
Secondary Limit	See slide 13 for Secondary Limit trading behavior

Trading Algorithm Definition – DynaPART (cont'd)

- Risk and Control
  - Instinet has a default set of cap limit checks applicable per-slice and price range checks which vary per market. These and other limits can be customised based on individual client requirements
  - Recommendations would include orders greater than a certain percentage of ADV, limit prices more aggressive than a certain percentage through the current far touch, order size or value greater than a specified amount, etc. We are happy to work with clients on any custom checks they wish to put in place for their flow
  - Further details on platform checks and price controls can be found in Appendix B
  - Given that at some point, aspects of participation-based strategies are likely to be reactive and respond to volume by crossing the spread, we have introduced changes that restrict how far away from the last traded price the most aggressive submission price can be for DynaPART. At present we constrain to the least conservative of +4 ticks and +2% aggressive
- Things to watch
  - The highest permissible target participation rate is 75%. High levels have the potential to cause adverse price impact and be regarded as detrimental to the fairness and orderliness of the market
  - Auction settings for markets without real-time indicative volume information, such as Indonesia where the auction is blind, will be based on historical profile data and the target participation rate. If the actual auction is light versus historical data it is possible that a disproportionately large auction slice will be released
  - If the Duration and Time Basis parameters are configured as well as Start Time and End Time and the values conflict, the Duration and Time Basis parameters will take priority
  - The more opportunistic the style setting the more the short-term deviation from the target participation rate. Strict style more closely tracks the desired participation level, but may incur more price impact and signalling risk
  - Symbology for the relative DynaPART Symbol is currently Instinet symbology
  - If no min part rate is supplied it is possible for the participation rate to drop very low

Trading Algorithm Definition – StepPART

- Trading Characteristics and execution behaviour
  - StepPART is a PART derivative strategy that allows participation at various rates depending on the current price of the stock relative to up to two user-defined price bands. Each band is configured with a direction, a price threshold and an associated participation rate, which in combination act to create the participation "steps" used by the algorithm. In addition, the user is able to configure a style that determines how strictly the algorithm attempts to remain on target. The more opportunistic the style setting the greater the freedom given to the algorithm to attempt to find price improvement. As with all the core strategies of the Experts® suite, the standard operation of StepPART is complemented by optional dark venue interaction via the dark aggregation logic contained in Instinet's Nighthawk® aggregation algorithm.

- Available Parameters

Field	Behaviour
Start Time	Configure a start time for the algorithm. The default is the later of the time of arrival and the start of continuous trading, including any opening auction period
End Time	Configure an end time for the algorithm. The default is the end time of continuous trading
Time Basis	Used in conjunction with the Duration parameter. Set a trading window around points in the day rather than using the start time and end time parameters ▪ ***OPEN –*** Start working the order at (or in, if configured) the opening auction and work it for the number of minutes defined in the "Duration" field ▪ ***CLOSE –*** Aim to complete the order at (or in, if configured) the closing auction and work backwards from there by "Duration" minutes to calculate the start time. *NB: if Time Basis and Duration conflict with the Start Time and End Time parameters the Time Basis and Duration will take priority*
Duration	Define a number of minutes as the execution horizon of the order. This is used in conjunction with the Time Basis field to allow an alternative to setting a start time or an end time. This is useful when sending orders across multiple time zones

Trading Algorithm Definition – StepPART (cont'd)

Field	Behaviour
Target Part Rate	Specify the target participation rate that StepPART should aim to be. Max allowable rate is 75%. When three separate rate bands are defined, the Target Part Rate is usually the participation rate applicable for the central band
Price Level 1/Price Level 2	The price points used to define the participation "step" bands
Direction 1/Direction 2	Where the stock's price needs to move to relative to the defined Price Levels in order for the new step participation rates to be applied. The options are: ▪ ***Above*** ▪ ***Below*** ▪ ***Based on Side*** – a move in the stock's price more passive than the defined Price Level limits
Rate 1/Rate 2	The participation rate to trade to when the stock's price has moved to satisfy the corresponding Direction and Price Level criteria
Style	The style parameter is used to control how tightly the algorithm tracks the real-time market volume. Generally, the tighter the volume is tracked, the less freedom the strategy has to search for liquidity and price improvement at other venues. Style options are ▪ ***Strict*** ▪ ***Normal*** ▪ ***Opportunistic***
Auction Type	Determines whether or not the algorithm will participate in any auctions. Options are: ▪ ***OPEN*** – just participate in the opening auction ▪ ***CLOSE*** – just participate in the closing auction ▪ ***ALL*** – participate in all scheduled auctions (default, excluding Japan PM Close) ▪ ***NONE*** – don't participate in any scheduled auctions
IWould Price	Define a price level at which the algorithm enters "I Would" mode. The algorithm's aim becomes to complete the order, or as much of it as possible, at this level. The Max Part Rate constraint does not apply during periods where the price is at or better than the "I Would" price
Block Exclusion	Defines the size of block trades beyond which, those trade blocks will be ignored in volume calculation by Algo. i.e Any trades above the specified Block Exclusion Value will be excluded
Secondary Limit	See slide 13 for Secondary Limit trading behavior

Trading Algorithm Definition – StepPART (cont'd)

Field	Behaviour
Floating Limit Type	See slide 12 for available floating limit types
Floating Limit Bps	Add an offset for the floating limit in basis points
Use Dark Liquidity	Instruct StepPART to suppress all interaction with off-exchange venues during its normal operation
Nighthawk Allocation %	Define a percentage of the order to be handled by Nighthawk over and above standard dark pool interaction in StepPART. For example if 20% is entered, StepPART will work the order as normal but give 20% of the quantity to Nighthawk to try and find block liquidity with in the meantime.
Nighthawk Limit Price	Define a separate, additional limit price for the Nighthawk Allocation percentage piece of the order
Max Dark Exposure	Configure a maximum quantity of the Nighthawk Allocation percentage that can be exposed to dark venues at any one time
Min Dark Fill	Define a minimum acceptable fill size to be sent to all venues that support it

Trading Algorithm Definition – StepPART (cont'd)

- Risk and Control
  - Instinet has a default set of cap limit checks applicable per-slice and price range checks which vary per market. These and other limits can be customised based on individual client requirements
  - Recommendations would include orders greater than a certain percentage of ADV, limit prices more aggressive than a certain percentage through the current far touch, order size or value greater than a specified amount, etc. We are happy to work with clients on any custom checks they wish to put in place for their flow
  - Further details on platform checks and price controls can be found in Appendix B
  - Given that at some point, aspects of participation-based strategies are likely to be reactive and respond to volume by crossing the spread, we have introduced changes that restrict how far away from the last traded price the most aggressive submission price can be for StepPART. At present we constrain to the least conservative of +4 ticks and +2% aggressive
- Things to watch
  - The highest permissible target participation rate is 75%. High levels have the potential to cause adverse price impact and be regarded as detrimental to the fairness and orderliness of the market
  - Auction settings for markets without real-time indicative volume information, such as Indonesia where the auction is blind, will be based on historical profile data and the target participation rate. If the actual auction is light versus historical data it is possible that a disproportionately large auction slice will be released
  - If the Duration and Time Basis parameters are configured as well as Start Time and End Time and the values conflict, the Duration and Time Basis parameters will take priority
  - The more opportunistic the style setting the more the short-term deviation from the target participation rate. Strict style more closely tracks the desired participation level, but may incur more price impact and signalling risk

Trading Algorithm Definition – Auction

- Trading Characteristics and execution behaviour

  - The Auction strategy is designed to allow users to delegate auction order flow to a strategy that will handle the individual logistics of different markets' auction mechanisms in a sensible way. The Auction strategy can be configured to operate in the Open, Close, the next scheduled auction from the point of arrival, or all of these, with any residual carried to the next available scheduled auction. It is also possible to configure a max part rate for auction participation. For markets where we have access to real-time indicative data, these values are used to calculate a submission size in accordance with the max participation rate supplied. For other markets we will use historical norms to calculate the order size. As an additional safety measure, it is possible to configure a max offset from the last trade in basis points (for the Open option, or where Next resolves to the opening auction, the PNC is used).

- Available Parameters

Field	Behaviour
Auction Type	Determines whether or not the algorithm will participate in any auctions. Options are: ▪ ***OPEN*** – just participate in the opening auction ▪ ***CLOSE*** – just participate in the closing auction ▪ ***ALL*** – participate in all scheduled auctions ▪ ***NEXT*** – participate in the next scheduled auction for the market
Max Part Rate	Add a max participation rate cap to the order (default is 100%)
Auction Max From Last (bps)	Add a max offset from the last trade (PNC if pre-open) to limit the aggressiveness of the auction submission

- In addition to the parameters described above we are able to configure defaults for:

  - ***HKX Eligible*** – determine whether Auction orders can be placed into the Instinet Hong Kong closing cross (closing auction orders only)

Trading Algorithm Definition – Auction (cont'd)

- Risk and Control
  - Instinet has a default set of cap limit checks applicable per-slice and price range checks which vary per market. These and other limits can be customized based on individual client requirements
  - Recommendations would include orders greater than a certain percentage of ADV, limit prices more aggressive than a certain percentage through the current far touch, order size or value greater than a specified amount, etc. We are happy to work with clients on any custom checks they wish to put in place for their flow
  - Further details on platform checks and price controls can be found in Appendix B

- Things to watch
  - Auction does not participate in intra-day auctions in Australia, Singapore IPO auctions or Korea ETF auctions

Electronic Trading Product – Smart DMA

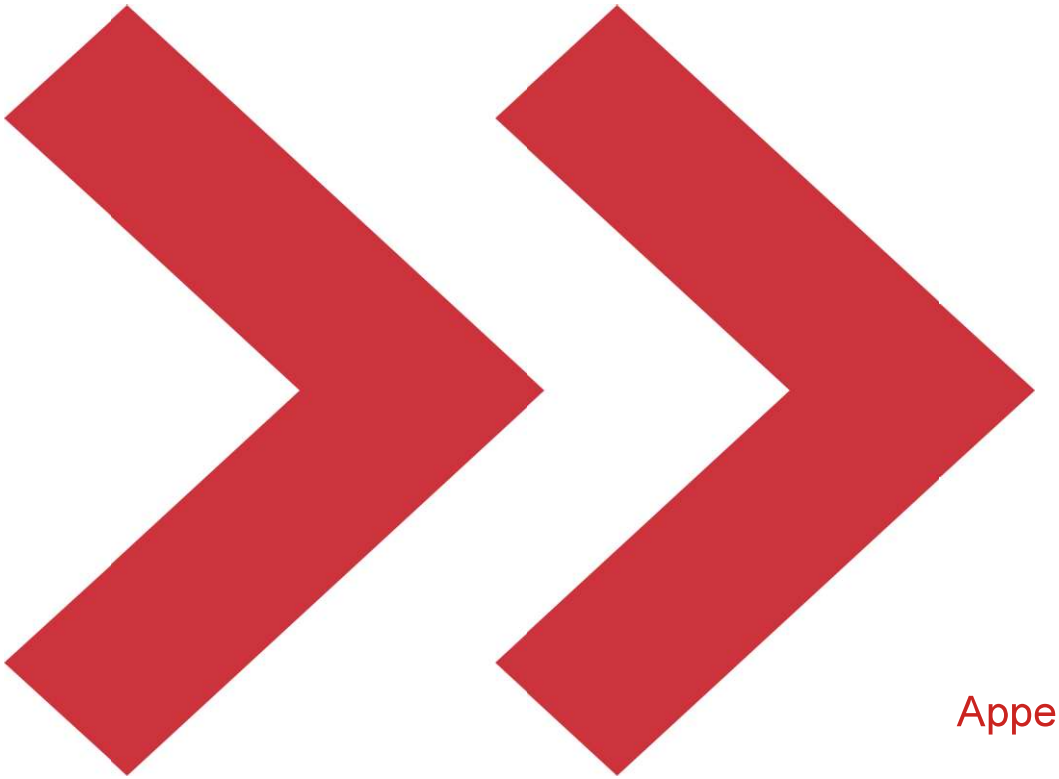
- Trading Characteristics and execution behaviour
  - Smart DMA is designed to normalise order flow across all markets in Asia, reducing the burden on traders to know the idiosyncrasies of each market and therefore reduce unnecessary order rejects. In addition, Smart DMA will provide best execution in countries where there are off exchange venues and dark pools operated by the Nomura Group. Priority is given to these off-exchange destinations where the price is equal to, or better than the exchange BBO. Once an order has been posted to the exchange Smart DMA will continue to monitor the alternate venues and should a better price become available, pullback only the necessary amount of shares. This ensures queue priority is maintained when the order cannot be completely filled off-exchange.
- Available Parameters

Field	Behaviour
Limit Orders	Specify the hard limit price of the order. Executions would always be at limit or better.
Market Orders	Where the exchange does not support market orders, Smart DMA will simulate by either slicing out at the far touch (and refreshing as each market level is taken) or by sending out at an aggressive limit price
Time In Force	Specify whether the order is DAY, IOC (Immediate or Cancel
Display Quantity	Simulate Iceberg orders where the exchange does not support it. Smart DMA will take all available liquidity in one go if the limit price of the parent is aggressive, and then slice out child slices equal to the display quantity

Electronic Trading Product – Smart DMA (cont'd)

- Additional Configuration
  - **Odd Lot Handling** – mixed lot orders will be traded until only the odd lot is left. The residual can then either be cancelled back or routed to an internal desk for manual intervention
  - **Short-sell control** – Smart DMA will take into account any local market rules around short-selling and only submit aggressive orders when they become eligible to trade
  - **Queuing** – Smart DMA will queue orders sent outside of market hours, or during blocking periods such as market lunch breaks. Any orders queued can be cancelled or amended in line
  - **Amending** – Position priority is always maintained wherever possible. Quantity increases will be added as a new order rather than a revision on the original

- Risk and Control Environment
  - By default Instinet has a set of cap limit checks applicable per order slice, which vary per market. On top of this, Smart DMA also provides an additional level of risk management:
    - Price range checking – stocks are grouped into buckets based on their current trading price. Limit prices on new orders are compared to the last traded price (or pervious close if none available) and will be rejected if they fall outside a certain threshold
    - Market orders – Smart DMA will prevent a simulated market order (used in Hong Kong, Singapore and Indonesia) from moving the market more than a certain percentage from order entry. Once fills on a market order hit the threshold the market order will be cancelled back.



Appendix A – Experts® Strategy Coverage Globally

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Coverage

		AMERICAS					EMEA																				APAC												
	STRATEGY	Brazil	Canada	Chile	Mexico	USA	Austria	Belgium	Czech Rep	Denmark	Finland	France	Germany	Greece	Hungary	Ireland	Israel	Italy	Netherlands	Norway	Poland	Portugal	South Africa	Spain	Sweden	Switzerland	UK	Australia	Hong Kong	Japan	Korea	India	Indonesia	Malaysia	New Zealand	Singapore	Taiwan	Thailand	Philippines	China Connect
Benchmark	VWAP	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦
	TWAP	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦
	IS	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦
	TEN	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦
Auction	Auction	♦	♦		♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦
	Target Open	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦
	Target Close	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦
Participation	PART	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦
	StepPART	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦
	DynaPART	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦
Liquidity-Seeking	BlockPeg	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦
	Cobra	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦
	Nighthawk		♦			♦	♦	♦		♦	♦	♦	♦			♦		♦	♦	♦		♦		♦	♦	♦	♦	♦	♦	♦										
	Make	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦													
	Work	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦
Other	Pairs	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦
	Portfolio IS					♦																																		

Appendix B – Further detail on Experts® Risk Controls

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Risk checks when trading via Experts Algos

1.1. Pre-trade (on parent order arrival) checks:

The following risk controls/validations are done by Experts upon any new algorithm order arrival.

Brief notes about table format:

Description: Gives a brief description of the expected control behavior

Action: Final action taken by strategy, if the control detects any risk

The risk controls have been classified under 2 types:

1) Mandatory : Control is mandatory and imposed by the system
2) Optional : Control is not mandatory and controlled by other inputs

The risk controls have been categorized under 3 major groups:

1) **Price risk prevention control**:
   Example: Prevent orders to be sent at a very aggressive price, when compared to last traded price

2) **Volume risk prevention control**:
   Example: Prevent sending a very large order when compared to current order book sizes

3) **False market prevention control**:
   Example: Prevent sending many slices passively or place and cancel repeatedly

Configuration: The configuration parameters applicable to the risk control settings (if any applicable)

Scope: Scope of the risk control

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Level: If the risk control is active on parent or child order

Notional Value Check	Description	Validate a single order versus a $USD set figure respective for that strategy
	Action	Order will be put on HOLD for manual review upon failure
	Type	Optional
	Category	Volume Risk Prevention Control
	Scope	All Strategies
	Configuration	This check can be enabled per client per strategy
	Level	Parent order level
	Key Error Message displayed in Console	Value Validation exception. Order Value is greater than
	Note	

Number of Shares Check	Description	Validation of single order quantity versus configurable number of shares.
	Action	Order will be put on HOLD for manual review upon failure
	Type	Optional
	Category	Volume Risk Prevention Control
	Scope	All Strategies
	Configuration	This check can be enabled per client per strategy
	Level	Parent order level
	Key Error Message displayed in Console	Quantity Validation exception. Order Quantity is greater than
	Note	

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Average Daily Volume Check	Description	Validation of single order quantity versus configurable % of Average Daily Volume (ADV) of the stock.
	Action	Order will be put on HOLD for manual review upon failure
	Type	Optional
	Category	Volume Risk Prevention Control
	Scope	All Strategies
	Configuration	This check can be enabled per client per strategy
	Level	Parent order level
	Key Error Message displayed in Console	Percent ADV exception. Order Quantity is more than
	Note	

Limit Price Check (Parent Limit)	Description	Checks whether the limit price of incoming order is (x % or 't' tick) away from Last Known Trade Price
	Action	Order will be put on HOLD for manual review upon failure
	Type	Mandatory
	Category	Price Risk Prevention Control
	Scope	All Strategies
	Configuration	% from Last Trade: 30% Number of Ticks from Last: 50 ticks
	Level	Parent order level
	Key Error Message displayed in Console	Price Validation exception. Order Price is more than
	Note	Validation is done only for orders with parent limit.
Limit Price Check (I Would Price)	Description	Checks whether the I Would Price of incoming order is (x % or 't' tick) away from Last Known Trade Price
	Action	Order will be rejected upon failure
	Type	Mandatory
	Category	Price Risk Prevention Control
	Scope	All Strategies, which support 'I Would Price' feature
	Configuration	% from Last Trade:10% (Pre-Open); 7% (continuous session) Number of Ticks: 3
	Level	Parent order level

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	Key Error Message displayed in Console	WOULD PRICE Validation failure
	Note	
Limit Price Check (Super Aggressive Style ONLY)	Description	Checks whether the limit price of incoming order is (x % or 't' tick) away from Last Known Trade Price
	Action	Order will be rejected upon failure
	Type	Mandatory
	Category	Price Risk Prevention Control
	Scope	IS, Block Peg & Cobra
	Configuration	% from Last Trade: 3 Number of Ticks from Last: 3
	Level	Parent order level
	Key Error Message displayed in Console	Super-Aggressive style for this algo needs a limit price
	Note	
Limit Price Check (Stop Price)	Description	Checks whether the STOP Price of incoming order is (x % or 't' tick) away from Last Known Trade Price
	Action	Order will be put on HOLD for manual review upon failure
	Type	Mandatory
	Category	Price Risk Prevention Control
	Scope	STOP Algo
	Configuration	% from Last Trade:8% Number of Ticks: 8
	Level	Parent order level
	Key Error Message displayed in Console	Stop price of 1.81500 is more than 8 ticks or 8.0% above reference
	Note	

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Hard Limit Price Check (Parent Limit)	Description	Only allow parent orders with limit price. Reject market orders
	Action	Order will be rejected
	Type	Optional
	Category	Price Risk Prevention Control
	Scope	All Strategies
	Configuration	Can be enabled by Client, Strategy, Market
	Level	Parent order level
	Key Error Message displayed in Console	Rejecting market order; limit price must be present
	Note	

Arrival Price Check (Market price)	Description	Validate the current stock price against configured customer threshold (min-max value). Either pause/reject the order back, if threshold is breached.
	Action	Order will be rejected/put on hold for review
	Type	Optional
	Category	Price Risk Prevention Control
	Scope	All Strategies
	Configuration	Can be enabled by Client, Strategy, Market
	Level	Parent order level
	Key Error Message displayed in Console	Failed Validation: Max Price Validation Threshold failed Failed Validation: Min Price Validation Threshold failed
	Note	

Floating Limit Price Check (Parent Limit)	Description	Validate the floating limit value in basis points against the maximum acceptable value, otherwise reject the order
	Action	Order will be rejected
	Type	Optional
	Category	Price Risk Prevention Control
	Scope	All Strategies (with floating limit)
	Configuration	5000 basis points

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	Level	Parent order level
	Key Error Message displayed in Console	The floating limit value BPS “xxx” has exceed the maximum.
	Note	Validation is done only for orders with floating limit.

Daily Aggregate Notional Check	Description	Validation of incoming order $value against a notional value set across all the flows at Client level.
	Action	Order will be rejected upon failure
	Type	Mandatory
	Category	Volume Risk Prevention Control
	Scope	All Strategies
	Configuration	Not Applicable
	Level	Parent order level
	Key Error Message displayed in Console	Credit Limit: Order: CUTOFF!!! Exposure
	Note	Daily Cap limit for Client is defined in Client Database

Max Part Rate check	Description	Validation of specified Max Part Rate versus configurable permissible max part rate.
	Action	Order will be put on HOLD for manual review upon failure
	Type	Optional
	Category	Volume Risk Prevention Control
	Scope	All Strategies
	Configuration	This check can be enabled per client per strategy
	Level	Parent order level
	Key Error Message displayed in Console	PartRate Validation exception. PartRate is greater than
	Note	

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Participation Rate Check (Required Finish Up rate)	Description	Validation of 'required participation rate' against configurable % of optimal allowed participation rate.
	Action	Order will be put on HOLD for manual review upon failure
	Type	Mandatory
	Scope	WORK (with must complete instruction)
	Category	Volume Risk Prevention Control
	Configuration	40%
	Level	Parent order level
	Key Error Message displayed in Console	Order With Likely Market Impact!
	Note	Algorithm will calculate 'required participation rate' needed to finish up the order within end time by estimating the expected volume to trade in market.

Participation Rate Check (User specified Participation Rate)	Description	Validation of 'user specified participation rate' against configurable % of optimal allowed participation rate.
	Action	VWAP/TWAP : Order will be put on HOLD for manual review upon failure PART : Order will be rejected upon failure
	Type	Mandatory
	Category	Volume Risk Prevention Control
	Scope	VWAP/TWAP (with max part rate as 100%) and Participation Strategies
	Configuration	This check can be enabled per client per strategy
	Level	Parent order level
	Key Error Message displayed in Console	Order With Likely Market Impact!
	Note	

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One-touch trader review	Description	Any new incoming algo parent orders / revision requests will be put under manual review
	Action	Order will be put on HOLD for manual review. User can chose to accept, reject or acknowledge the pending request.
	Type	Optional
	Category	False Market Prevention Control
	Scope	All Strategies
	Configuration	This check can be enabled per workflow, per market, per client
	Level	Parent order level
	Key Error Message displayed in Console	Validation Failure: *One Touch*
	Note	

Exchange account check	Description	Validates if the Exchange account is provided on the parent order
	Action	Order will be put on HOLD for manual review upon failure
	Type	Optional
	Category	False Market Prevention Control
	Scope	All Strategies
	Configuration	This check can be enabled per workflow, per market, per client
	Level	Parent order level
	Key Error Message displayed in Console	ExchangeAccount Missing
	Note	

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Korea short sell restricted stock check	Description	Validates if the symbol-side combination of new incoming order against the Korea Short Sell restricted stock list, provided by exchange
	Action	Order will be rejected upon failure
	Type	Optional
	Category	False Market Prevention Control
	Scope	All Strategies for Korea
	Configuration	This check can be enabled per client, flow type
	Level	Parent order level
	Key Error Message displayed in Console	KR ShortSell Overheat Side: SellShort Symbol:
	Note	

India SMS Stock List Block Validation	Description	A regulatory requirement in India to put on-hold algo orders for SMS Stock list
	Action	Order will be put on HOLD for manual review upon stock in SMS list
	Type	Mandatory
	Category	False Market Prevention Control
	Scope	All Strategies for India
	Configuration	
	Level	Parent order level
	Key Error Message displayed in Console	Symbol on SMS list
	Note	

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India Breach List or RED flag status check	Description	Validates if the symbol-side combination of new incoming order against the India Breach / Red Flag Status list, provided by exchange
	Action	Order will be paused / rejected upon failure
	Type	Mandatory (for Buy orders only)
	Category	False Market Prevention Control
	Scope	All Strategies for India
	Configuration	A buy order for a stock in Red flag status would be paused for manual review. A buy order for a stock in Breach list would be rejected
	Level	Parent order level
	Key Error Message displayed in Console	SymbolRedFlagged
	Note	
Outstanding Shares Check	Description	Validate the incoming order quantity against a % of total outstanding shares for the symbol in the exchange
	Action	Order will be put on HOLD upon failure
	Type	Optional
	Category	Volume Risk Prevention Control
	Scope	All Strategies
	Configuration	This check can be enabled per client
	Level	Parent order level
	Key Error Message displayed in Console	
	Note	

Exchange account check	Description	Validates if the Exchange account is provided on the parent order
	Action	Order will be put on HOLD for manual review upon failure
	Type	Optional
	Category	False Market Prevention Control
	Scope	All Strategies
	Configuration	This check can be enabled per workflow, per market, per client

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	Level	Parent order level
	Key Error Message displayed in Console	ExchangeAccount Missing
	Note	

Opposite Side check	Description	Validation of the new incoming order against the active/previously traded orders with same symbol but opposite side
	Action	Order will be put on HOLD for manual review upon failure
	Type	Optional
	Category	False Market Prevention Control Check
	Scope	All Strategies
	Configuration	This check can be enabled per client, per strategy, per market
	Level	Parent order level
	Key Error Message displayed in Console	Client has order on opposite side
	Note	

Connect Close Trading Check	Description	Impose mandatory X% price limit from last known trade in closing auction (x = 2% for stocks part of SSE50 index otherwise use 3%)
	Action	None
	Type	Mandatory
	Category	Price Risk Prevention Control Check
	Scope	All Strategies (trading in Connect Close Auction)
	Configuration	2% for SSE50 Index stocks and others stocks = 3%
	Level	Child order level
	Key Error Message displayed in Console	None
	Note	All close auction algo child orders for Connect would be capped by x% aggressive price limit from last known trade

Pairs Trigger Value Validation Check	Description	Validate the "required price" calculated by Pairs based on User input pair terms (trigger value & ratio/spread) against the last known trade in market. If the required price is more aggressive than last known trade than permissible threshold (% or tick terms) which ever is more aggressive then the order would be put "on hold" for trader review
	Action	Order will be put on HOLD for manual review upon failure
	Type	Mandatory
	Category	False Market Prevention Control Check
	Scope	Pairs
	Configuration	%, Ticks from last trade
	Level	Parent order level
	Key Error Message displayed in Console	Pairs trigger value too aggressive
	Note	

1.2. Real-time trading controls :

The following risk controls/validations are done by Experts during the trading duration:

Flash Crash Detector (Index Relative Check)	Description	Flash Crash Detector is a functionality to signal a parent order when market drastically moves against it. It kicks in when the rolling relative return of the symbol against general market index breach a pre-set threshold value
	Action	Order will be put on HOLD for manual review upon failure
	Type	Mandatory (HK, SG,IN,TH,AU markets)
	Category	Price Risk Prevention Control
	Configuration	Reference Symbol : Main index for the market Reference Window : 5 minutes Initial threshold : 9.9% Incremental threshold : 5%
	Scope	All Strategies (only in continuous trading session)
	Level	Parent order level

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	Key Error Message displayed in Console	FLASHCRASH Detected
	Note	**Calculation logic:** *RRR at any time (t)* = Relative return of the stock (last 5 minute window) - Relative Return of the Index (last 5 minute window) *Relative return of the stock (last 5 minute window)* = [stock last trade price at (t) - stock last trade price at (t - 5) minute] / stock last trade price at (t -5) minute *Relative return of the Index (last 5 minute window)* = [index last value at (t) - index last value at (t - 5) minute] / index last value at (t -5) minute

Maximum Number of Shares per Slice Check	Description	Validation of single order child slices quantity versus configurable number of shares.
	Action	Order quantity will be revised down to configured cap
	Type	Mandatory
	Category	Volume Risk Prevention Control
	Scope	All Strategies
	Configuration	3000 Lots
	Level	Child order level
	Note	

Maximum Number of Price Levels for Market Making	Description	Variable to control the number of passive active price levels used by Market Maker (Liquidity Provider)
	Action	Maker slices at more passive price levels are blocked.
	Type	Mandatory
	Category	Volume Risk Prevention Control
	Scope	All Strategies
	Configuration	By Stock
	Level	Child order level
	Note	

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Deviation of child Slice price from last trade Check	Description	Validation of the strategy calculated child limit price is more than (x % or 't' tick) away from Last Known Trade Price
	Action	Price will be passively revised down to configured cap
	Type	Mandatory
	Category	Price Risk Prevention Control
	Scope	All Strategies – (Continuous trading only)
	Configuration	Schedule Based Algos: 5% from last trade or 5 ticks from last trade Participation Based Algos: 2% from last trade or 4 ticks from last trade Tactical Algos: 10% from last trade or 20 ticks from last trade
	Level	Child order level
	Key Error Message displayed in Console	Sub stopped by compliance checks
	Note	Validation is enforced upon - Entry of new child order and - Revision of price of an open child order

Notional Value Check	Description	Validate the single child order value versus a $ set figure
	Action	Order value will be revised down to configured cap
	Type	Mandatory
	Category	Volume Risk Prevention Control
	Scope	All Strategies
	Configuration	USD 34905638
	Level	Child order level
	Note	

Fair Price Check (Spike Pause Price Model)	Description	Functionality to control the liquidity provision at inefficient or unattractive prices with two objectives - one to maintain a concept of fair price, another to monitor short term volatility. The strategies utilize the pricing model to micro-manage their child orders, setting internal price limits

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	Action	Price will be passively revised down to configured cap
	Type	Mandatory
	Category	Price Risk Prevention Control
	Configuration	Not Applicable
	Scope	Schedule based and Participation Strategies (only in continuous trading)
	Level	Child order level
	Key Error Message displayed in Console	Paused at '' after price spike. Spread is. Near touch / Far touch size imbalance is
	Note	The model applies a limit based on the recent average (Competing Efficient Price) price plus a margin to give a limit under normal operation. It also monitors the spread and size ratio imbalances. The Competing Efficient Price tracks the exponentially weighted moving average price for a stock looking over the short term and long term and compares them to the current market price. When market prices change, the model determines whether the new price is considered reasonable relative to the way the market is moving or if there is a risk of "getting walked up" to a price that may soon revert. An exponential weighting applies more weight to the most recent prints which falls off quickly for more stale print data.

Prevention of new day high/low of day check	Description	Validation of the strategy calculated child limit price is already traded in market
	Action	Order value will be revised down to configured cap
	Type	Mandatory
	Category	Price Risk Prevention Control
	Scope	Schedule Based Strategies (only in continuous trading)
	Configuration	Not Applicable
	Level	Child order level
	Note	
Auction Price Gap Alert	Description	Stock indicative price in auction moves by more than 5% and shares impact in US$ notional is > 10K (see notes)
	Action	Alert sent with order details and trader name to monitoring chat room
	Type	Optional
	Category	Price Risk Prevention Control

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	Scope	All Strategies (applicable only for Auction Slices)
	Configuration	ALERT_PRICE_GAP_ENABLED,TRUE ALERT_PRICE_GAP_PRE_OPEN_PRC,5 ALERT_PRICE_GAP_USD_IMPACT,10000
	Level	Child order level
	Note	Pre-open IEP price +/-5% and US$ impact >= 10K US$impact = abs(US$ notional * (IEP/PNC) -1)
Auction Price Check (against reference price)	Description	Validation of the strategy calculated child limit price against a configured threshold (number of ticks) from Indicative Auction Price (IEP)
	Action	Price will be passively revised down to configured cap
	Type	Mandatory (HK, TH)
	Category	Price Risk Prevention Control
	Scope	All Strategies (applicable only for Auction Slices)
	Configuration	20 Ticks
	Level	Child order level
	Note	If there is no IEP available (no expected match in auction) for the stock, last traded price will be used instead of IEP
Auction Price Check (against snapped reference price)	Description	Validation of the strategy calculated child limit price against a configured threshold (% band, number of ticks) from snap reference price (SRP)
	Action	Child order slice will not be allowed to send to market
	Type	Mandatory (HK,TH)
	Category	Price Risk Prevention Control
	Scope	All Strategies (applicable only for Auction Slices)
	Configuration	15% and 30 Ticks
	Level	Child order level
	Note	snap reference price (SRP) = Most aggressive of below 3 prices 1. Snapped market price at the start of auction order and 2. Snapped IEP at the start of auction order 3. Last known trade

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Strategy Behavior Monitoring Check (New Order Entry)	Description	Monitor number of new child orders within a configurable time period
	Action	If breached, generate Error Alert to GTR Console and Dashboard
	Type	Mandatory
	Category	False Market Prevention Control
	Scope	All Strategies
	Configuration	30 slices in 3 secs
	Level	Child order level
	Key Error Message displayed in Console	submissions are continuously being made
	Note	GTR Console and Dashboard are monitoring tools
Strategy Behavior Monitoring Check (Repeated place/cancel)	Description	Monitor the below repeated behavioral pattern within a configurable time period by a parent strategy order 1. Place new child order 2. Cancel child order 3. Place new child order 4. Cancel child order…
	Action	If breached, generate Error Alert to GTR Console and Dashboard
	Type	Mandatory
	Category	False Market Prevention Control
	Scope	All Strategies
	Configuration	30 slices in 3 secs
	Level	Child order level
	Key Error Message displayed in Console	too many cancel/replace rejects
	Note	GTR Console and Dashboard are monitoring tools
Strategy Behavior Monitoring Check (Revise action)	Description	Monitor number of revision request for a child order within a configurable time period
	Action	If breached, generate Error Alert to GTR Console and Dashboard
	Type	Mandatory
	Category	False Market Prevention Control
	Scope	All Strategies
	Configuration	10 replaces in 3 secs
	Level	Child order level

	Key Error Message displayed in Console	submission id: XXX for parent order id: YYY instrument@dest: m@n is being replaced faster than allowed time; replace count: 10
	Note	GTR Console and Dashboard are monitoring tools

Auction Behavior Monitoring Check (last trade reference check)	Description	Indicative Auction Price (IEP) of the stock is away by more than a configured (%, number of ticks) from last traded price.
	Action	If breached, generate Error Alert to GTR Console and Dashboard
	Type	Mandatory
	Category	False Market Prevention Control
	Scope	All Strategies (in auction trading sessions)
	Configuration	% from last trade: 8 Number of ticks from last: 10
	Level	Child order level
	Key Error Message displayed in Console	Large %Move in Auction
	Note	GTR Console and Dashboard are monitoring tools
Auction Behavior Monitoring Check (ADV reference check)	Description	Validation of the exposed order quantity versus configurable % of Average Daily Volume (ADV) of the stock
	Action	If breached, generate Error Alert to GTR Console and Dashboard
	Type	Mandatory
	Category	False Market Prevention Control
	Scope	All Strategies (in auction trading sessions)
	Configuration	% of ADV threshold: 5%
	Level	Child order level
	Key Error Message displayed in Console	Exposure against X% of ADV
	Note	GTR Console and Dashboard are monitoring tools
Auction Behavior Monitoring Check	Description	Validation of the exposed order quantity versus configurable % of Historic Auction Volume and Indicative Auction Volume (IEV)
	Action	If breached, generate Error Alert to GTR Console and Dashboard
	Type	Mandatory

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(Historical Volume reference check)	Category	False Market Prevention Control
	Scope	All Strategies (in auction trading sessions)
	Configuration	% of IEV threshold: 30% % of Historic Volume threshold: 700%
	Level	Child order level
	Note	GTR Console and Dashboard are monitoring tools

Floating Limit (Price Risk Prevention Control)	Description	Validation of the strategy calculated child limit price versus one or more benchmark. i.e. index relative, VWAP etc.
	Action	Price will be passively revised down to configured cap
	Type	Optional
	Category	Price Risk Prevention Control
	Scope	All Strategies
	Configuration	User parameter
	Level	Parent order level
	Note	

Monitor Price Move from Arrival	Description	Validation of the current market price versus arrival price by configurable band
	Action	If breached, generate Error Alert to GTR Console, Monitor, e-mail, chat and Dashboard
	Type	Optional
	Category	Price Risk Prevention Control
	Scope	Schedule Based & Participation Strategies
	Configuration	Not Applicable
	Level	Parent order level
	Key Error Message displayed in Console	OngoingPriceValidation
	Note	GTR Console, Monitor and Dashboard are monitoring tools Sending error alert by E-Mail / Bloomberg or AIM Chat need to be configured

1.3. Additional controls:

In addition to above risk controls, the trading behavior of market making (liquidity provision) and market taking (aggressive catch up) components have additional protection mechanisms as described below:

1) **Market Maker (liquidity provider – Passive trading) component:**
   All child slice slices price calculation will be bound by Price Risk Prevention Controls described in above section.

   a) Price considerations:
      Maker will always place orders passively at near touch price. It will never send any order more aggressive than current near touch price.
      Place order at best possible price considering below prices:

- Near Touch Price (Best bid for Buy, Best Ask for Sell)
- Client Limit Price
- Floating Limit Price (if any set by Client)
- Mandatory Control Limit Price (Risk controls mandatorily imposed by strategy like price model, not a day high low price…All are described in above section)

   b) Size considerations:
      All child slice shares will be bound by Volume Risk Prevention Controls described in above section. In addition to that for Schedule based and Participation based strategies, maker will consider the below factors:

- Max Size Check : Check the current quote sizes (bid size, offer size, rolling average quote size, historic quote sizes) and place only a % (like 30%) of quote sizes
- Minimum Size Check: In order to prevent sending too many small child slices (like 1 lot or 2 lots for a large parent order) strategy will use an Intelligent Submission Size framework to calculate a minimum size for all child orders. The Intelligent Submission Size framework considers the below factors:

- Parent order size

- Average Trade Size
- Expected Volume to Trade
- Minimum $ Value

Maker would also randomization technique to prevent sending same size orders.

c) Maximum Cap restriction on Number of Open Child orders:
Strategy will enforce a maximum cap (configurable setting of 5) on the maximum number of open child orders (at near touch or best price, if price constrained) for a parent order passively at any time.

Maximum Number of Passive Open Slices (per parent order)	Description	Maximum number of open passive slices per strategy parent order
	Action	New slices will be blocked
	Type	Mandatory
	Category	Volume Risk Prevention Control
	Scope	All Strategies
	Configuration	**5**
	Level	Child order level
	Note	

Part Ladder (The market making tactic) also enforces additional smart sizing constraint, by each price level.
Example: If there are no open slices at a particular price level, allow the requested child slice with no size constraint
If we already have a child slice open at that price level, requested new child slice size should be > 20% of average quote size otherwise the slice is not submitted to market.
If we already have 2 child slices open at that price level, requested new child slice size should be > 60% of average quote size
It also limits the maximum number of open slices at any price level (below near touch) to 3.

2) **Market Taker (liquidity taking – Aggressive catch up trading) component:**
All child slice slices price calculation will be bound by Price Risk Prevention Controls described in above section.

a) Price considerations:
Taker will always place orders aggressively at far touch (market) price. It will never send any order more aggressive than current market price except for India and Finishing Up action in Schedule based algos (Strategy will NEVER try to sweep multiple price level at one time)

Place order at best possible price considering below prices:
- Far Touch Price (Best Ask for Buy, Best Bid for Sell)
- Client Limit Price
- Floating Limit Price (if any set by Client)
- Mandatory Control Limit Price (Risk controls mandatorily imposed by strategy like price model, not a day high low price…All are described in above section)

b) Size considerations:
All child slice shares will be bound by Volume Risk Prevention Controls described in above section. In addition to that for Schedule based and Participation based strategies, taker will be bound by current market size at far touch size (1 level) except for India and Finishing up action in Schedule based algos.

In India due to the nature of the market trading behavior, algo takers are configured to place orders aggressively up to 3 ticks aggressive than far touch price and a size constrained by 2 times the historic average quote size (which could be greater than actual far touch size)

1) What is a finish up action?

All Schedule based algos orders have a finish up logic at near the end of continuous trading session to ensure completion (if not volume/price limited) of the order.
The finish up action, works like a TWAP schedule (split the remaining shares in about every 5 seconds window and finish up duration varies by market but typically < 1 minute before end of continuous trading).

The finish up portion, which is targeted to clean up small residual at end, can't be handed over to trade earlier.

2) What are the mandatory price checks (specifically added for) Finish Up action?

To ensure orderly trading behavior, the Finish up worker is specifically bound by a 'Snap Price Check".

Snap Price Check for Finish Up action:

Below configured limits for Finish Up action have been set (configurable by market).

a) Maximum Allowed Percentage: 10%

b) Maximum Allowed Ticks: 15 (to take care of penny stocks). (some markets have override to smaller value)

At the start of finish up action, Algo would snap the far touch price and apply configured limits (maximum 10% or 15 ticks, whichever gives most aggressive price) to determine the maximum price move permitted for finish up. (how far the price can be pushed from the snapped price)

Note that the mandatory price & volume risk controls like Flash Crash Detector, Threshold check against Last Trade (mentioned in this document) also applies for the FinishUp worker.

Auction Worker (Auction Sessions Trading) component:

Expert Algorithm uses “historical expected auction volume”, “previous close/last trade”, “indicative auction volume” and “indicative auction price” to make sizing and pricing decisions in auction sessions.

Expected auction volume (historical) is calculated using volume profile and 20 day ADV.
Indicative Auction Volume and Indicative Auction Price are obtained from real time market data feed.

Price considerations:
‘**At Market Auction Order**’ for parent orders with no limit price.
‘Limit Auction Order’ for parent orders with limit price.

“Limit Auction Orders”, algo will perform the mandatory price checks as mentioned before in this document.

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Price Revisions:

"Limit Auction Orders":
If the "Indicative Auction Price" moves away {against Algo side}, Expert Algorithm would revise the price to 20 ticks aggressive from "Indicative Auction Price'. New required price will be bound by 'snapped price reference check' in auctions.

If the "Indicative Auction Price" moves into {favorable to Algo side}, Expert Algorithm will NOT do any price revisions.

If no indicative auction price is available, Expert Algorithm will use the "Previous Close in AM open and Last Trade in PM Open and Close auctions" as reference price and will place 5 ticks aggressive from reference price.

Size considerations:

MOO/MOC/Schedule based algos like VWAP/TWAP would likely submit all shares in one child slice.

PART orders which are tracking auction volume will place child orders as per required "target participation rate" and "auction volume". Participation based orders in auction (i.e trading at specific target rate in auction) would use the maximum of (Historical expected auction volume or real time indicative auction volume) as the reference volume until the last minute prior to auction match. In the last minute, Expert Algorithm would use only the real time indicative auction volume as the reference volume.

Expert Algorithm would evaluate size and price decision at every 30 second time interval until the last minute prior to the auction match in every auction session.

In the last minute of the auction session, Expert Algorithm would evaluate the size and price decision on every update of real time of indicative auction data.

Auction Minimum Submission Size

a) Objective:

Prevent the algo from making small quantity changes (creating small child slices / cancelling) in auction session

b) Threshold Value:

Auction MSS is dynamically adjusted based on order target rate (small or large) and indicative auction volume (large or tiny).

Currently Auction MSS Rate is set as 10% of Target rate.

Examples:

- Case 1 : Order auction target rate is 10% and IEV is 65000 shares. Auction MSS = 650 shares (1% of IEV)
- Case 2 : Order auction target rate is 15% and IEV is 5300 shares. Auction MSS = 80 shares (1.5% of IEV)

c) Exclusions:

Auction MSS is removed (set as 0) in the last 10 seconds prior to the auction match time.

This is allow the algo order to send (one small) child slice as required to keep up the user set target rate.

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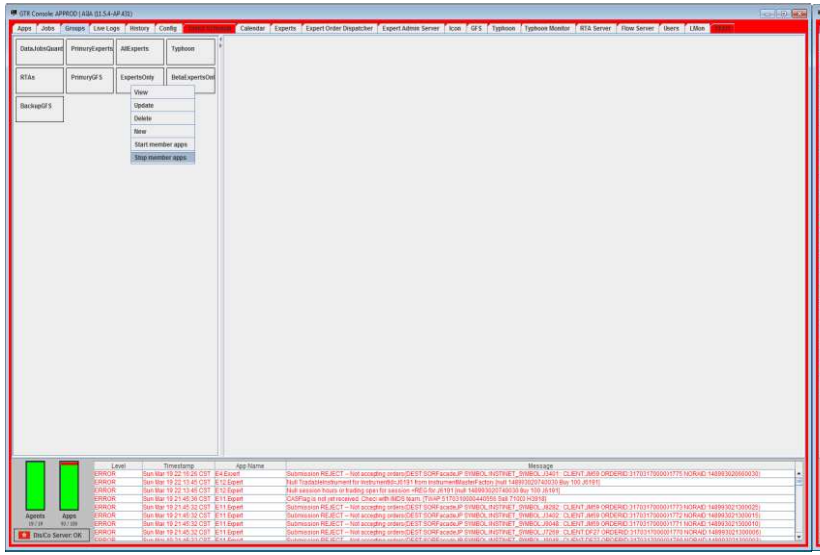
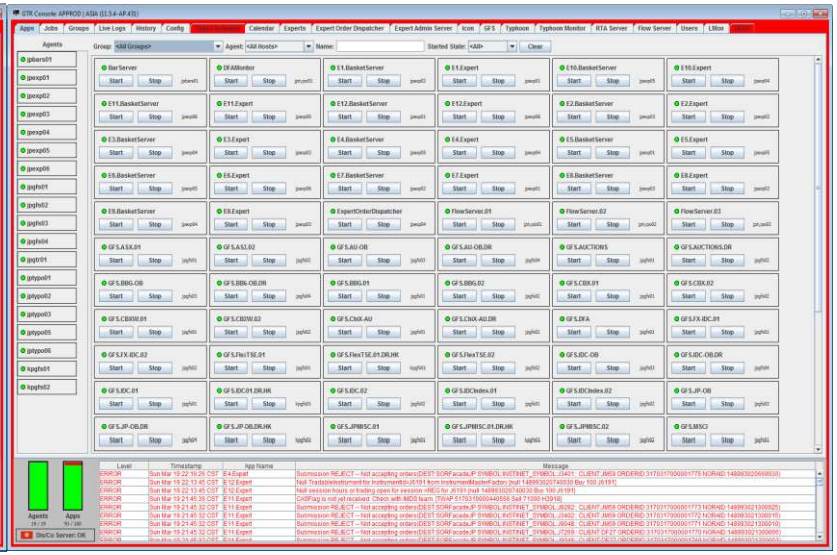
1.4 Kill Switch controls :

A dedicated support team called “GTR Asia Operations” monitors the behavior of Algorithms using in house built support tools including “GTR Console”, “Expert Monitor”, “Dash Board”, and “Core Web”. All these applications require individual login credentials and authentication. “GTR Asia Operations” can manually stop one/all the algorithm processes using “GTR Console” (see below screen shot)





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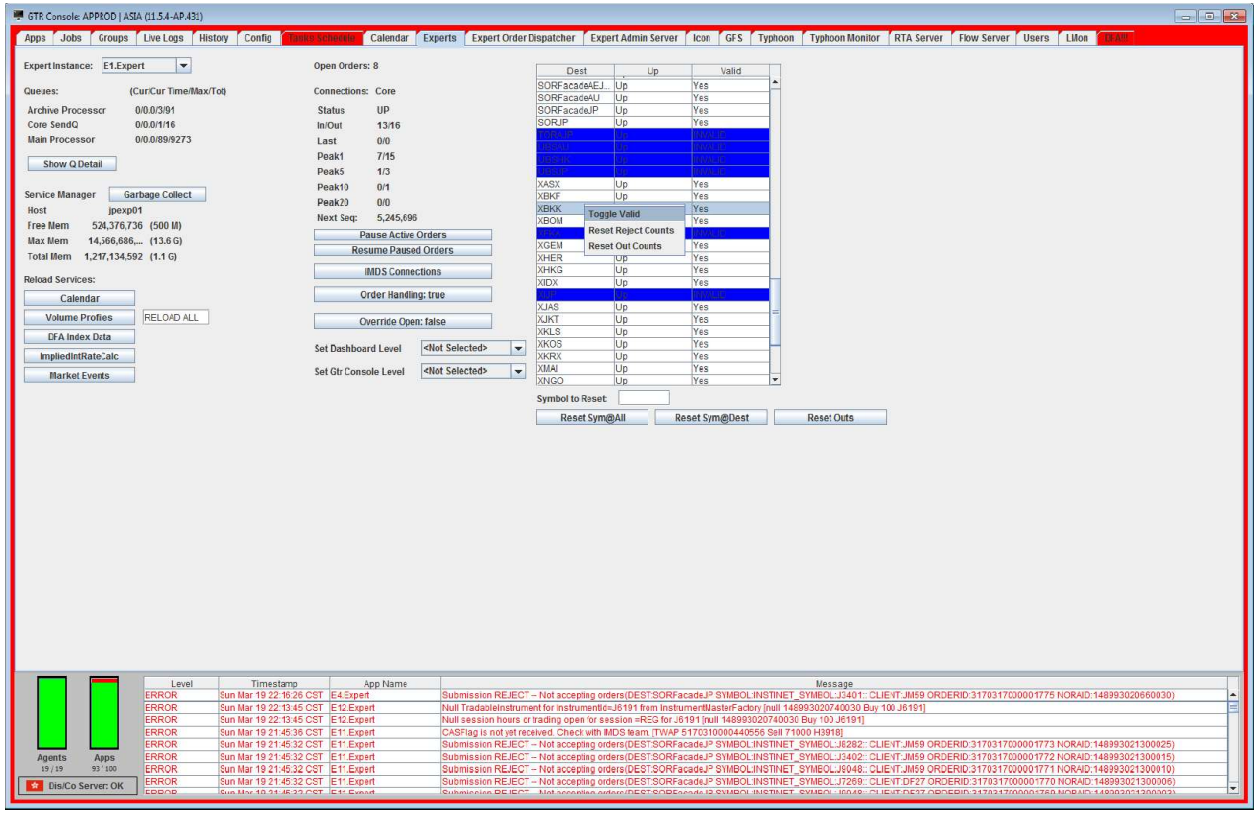
If required, “GTR Asia Operations” can disable a particular destination (e.g. Hong Kong Gateway) by using the below option. In this case, Algo engine will continue to trade orders for other markets but will NOT send any new order/revision/cancel to disabled destination.



By Market:

If required, “GTR Asia Operation” team can manually pause all the parent orders for a particular exchange (e.g. Thailand exchange) from “Expert Monitor”. In this case all the algo orders for that exchange will stop trading.

By Algo:

Similarly “GTR Asia Operation” team can manually pause all the parent orders for a particular algo (e.g. VWAP) from “Expert Monitor”. In this case all the VWAP algo orders will stop trading.

By Client:

Similarly “GTR Asia Operation” team can manually pause all the parent orders for a particular client (e.g. XYZ) from “Expert Monitor”. In this case all the algo orders for that client will stop trading

By Algo Server:

Similarly “GTR Asia Operation” team can manually pause all the parent orders for a particular algo server (e.g. E1.Expert) from “Expert Monitor”. In this case all the algo orders for that server will stop trading

If any parent order is paused, algo would immediately cancel all the open child orders in the market and stop trading. Alternatively pausing of all the algo orders can also be done from “GTR Console”.

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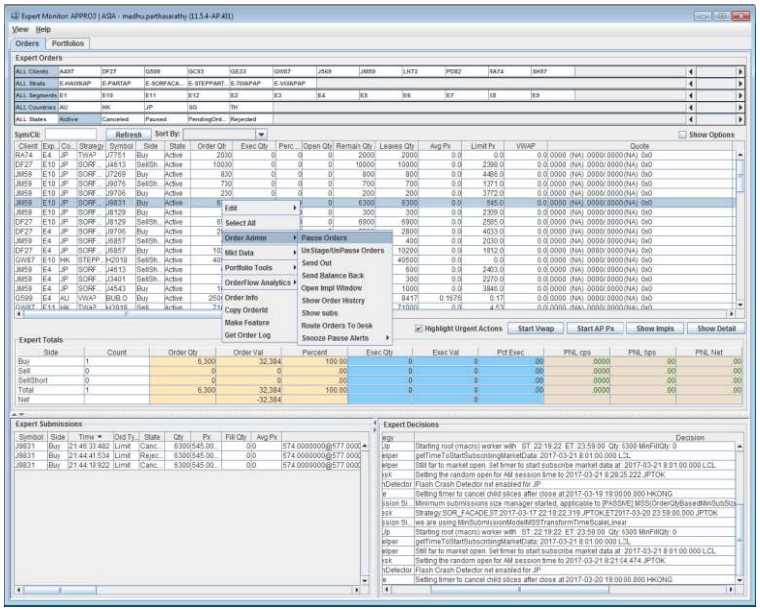

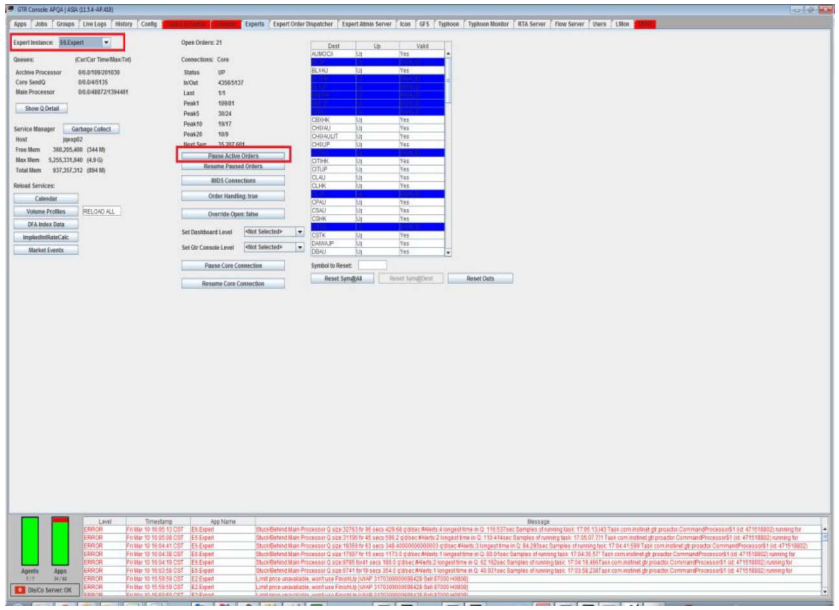

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