

BTS[®]

Strategy Service Strategies for the IDEM Market Manual

v. 1.2

20th December 2017



London
Stock Exchange Group

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1 Revision History

Date	Version	Description	Author
2014/09/16	1.0	First Release	Borsa Italiana
2016/04/29	1.1	BTS [®] registered trademark update	Borsa Italiana
2017/12/20	1.2	MiFID II changes	Borsa Italiana

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2 Introduction

2.1 Purpose

Purpose of this document is to supply guidelines to configure and execute **instances** of existing strategies (or strategy **templates**) as available in the BTS[®] Strategy Monitor tool: current strategy templates have been developed for the derivatives market.

The BTS[®] enables the creation of new strategy templates on further markets supported, too: customers can address commercial BTS[®] representatives to discuss requests for enhancements.

The look and feel of the graphical user interface may change depending on the client version in use: in previous versions the appearance of graphical elements can be different and not all the features available.

It is in any case suggested to update the client to the latest released available version in order to exploit the most recent improvements introduced and the new features deployed. BTS[®] client latest version is always available at the following url:

<http://www.borsaitaliana.it/borsaitaliana/gestione-mercati/bts-bittradingstation/bts.htm>

<http://www.borsaitaliana.it/borsaitaliana/gestione-mercati/bts-bittradingstation/bts.en.htm>

2.2 Validity and References

The information contained in this document is related to the multimarket BTS[®] client application.

Further information about specific functions (quoting, authorization module for pre-trade checks, etc.) can be found in ad-hoc manuals available on the BTS[®] page (<http://www.borsaitaliana.it/borsaitaliana/gestione-mercati/bts-bittradingstation/bts.en.htm> and <http://www.borsaitaliana.it/borsaitaliana/gestione-mercati/bts-bittradingstation/bts.htm>).


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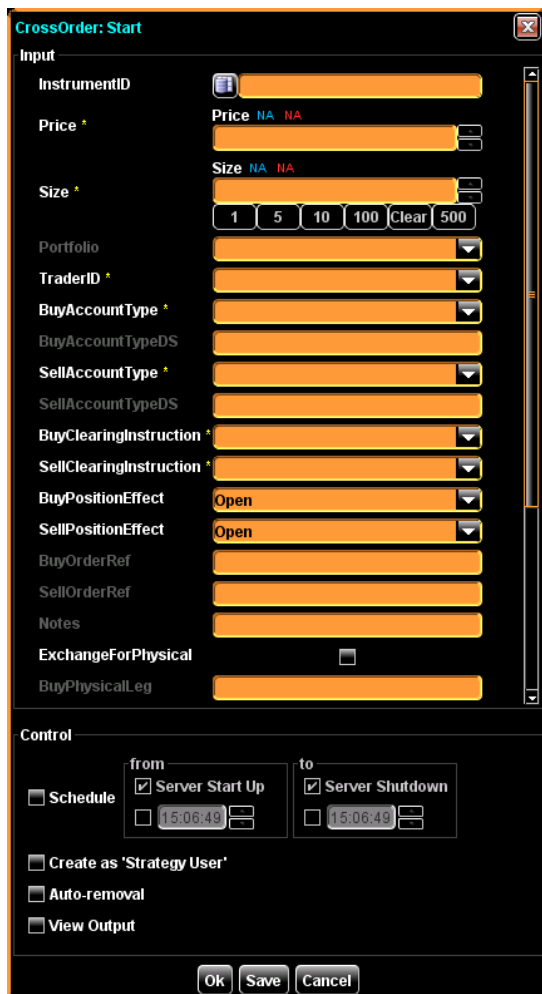
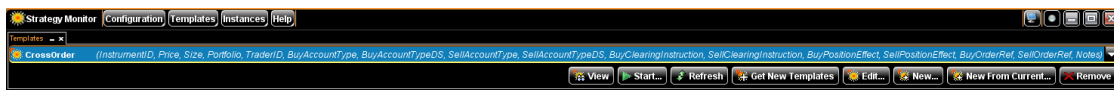
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3 General Information

The strategies described in this document are pre-defined algorithms that perform automated actions in the IDEM market through the Strategy Service on the basis of values assigned by the user to input variables and market data automatically subscribed to by strategies instances.

In order to run an instance of a strategy the user must access the Strategy Monitor tool in the Tools  menu of the main platform toolbar, then select a strategy (e.g. CrossOrder) in the combo-box of the Templates pane and finally press the Start button.



A data entry window below pops up so that the user can enter data for the input variables of the strategy instance and then press the **Ok** Button (see picture on the left).













The new strategy instance of the **CrossOrder** strategy is displayed both in the **All** subpane and in the **CrossOrder** subpane of the **Instances** pane, as shown below (**CrossOrder** subpane).

Here follows a list of possible states for strategy instances:

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	Stopped	The strategy instance is not receiving any market data and has no active orders in the market. It can be moved to the  Started state by right-clicking it and then selecting the Start command.
	Started	The strategy instance is receiving market data and can possibly send orders to the market. It can be moved either to the  Suspended state by right-clicking it and then selecting the Suspend command or to the  Stopped state via the Stop command.
	Suspended	The strategy instance has been suspended or has suspended itself. It is receiving market data, but it can no longer send orders to the market. It can be moved either to the  Started state by right-clicking it and then selecting the Resume command or to the  Stopped state via the Stop command.
	Executed	The strategy instance has reached a completion state (for example, it has matched the whole size that it was configured to execute). It is not processing market data, has no orders in the market and cannot send any more. It can be moved only to the  Stopped state by right-clicking it and then selecting the Stop command
	Error	The strategy instance has one or more input variables of Instrument type, the values of which are not present in the Reference Data of the corresponding market. If the Reference Data has been correctly downloaded at the platform start-up, this state means that the instrument value (kept from previous days as part of the instance data set saved in the platform database) is no longer in the market, most probably because it has expired.
	Recovery	The strategy instance is in a temporary state, typically after a crash of the Strategy Service, which is being reported to the user while the recovery process is on-going. If the Strategy Service was running and suddenly crashed, the instance execution is resumed at the next restart of the Service, if the strategy

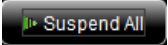
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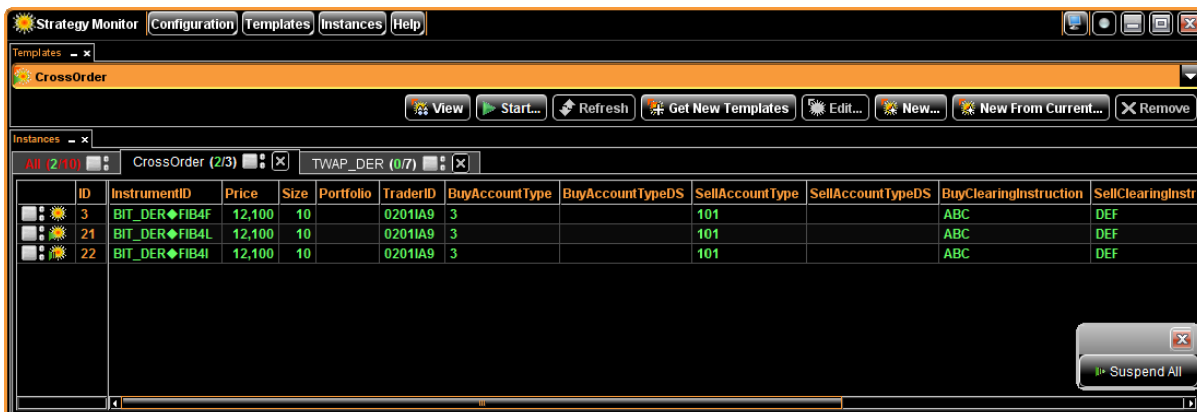
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instance was not marked for automatic removal (see the **Auto-removal** checkbox at the bottom of the data entry window above).

In the popup window which appears pressing on the "Help" button in the Strategy Monitor top bar, the states listed under 'Templates' and the state 'Invalid' refers to the strategy design phase, therefore they are out of scope and not described in this document.

An anti-panic button  is available in order to move all strategy instances to the

 **Stopped** state with a single click.

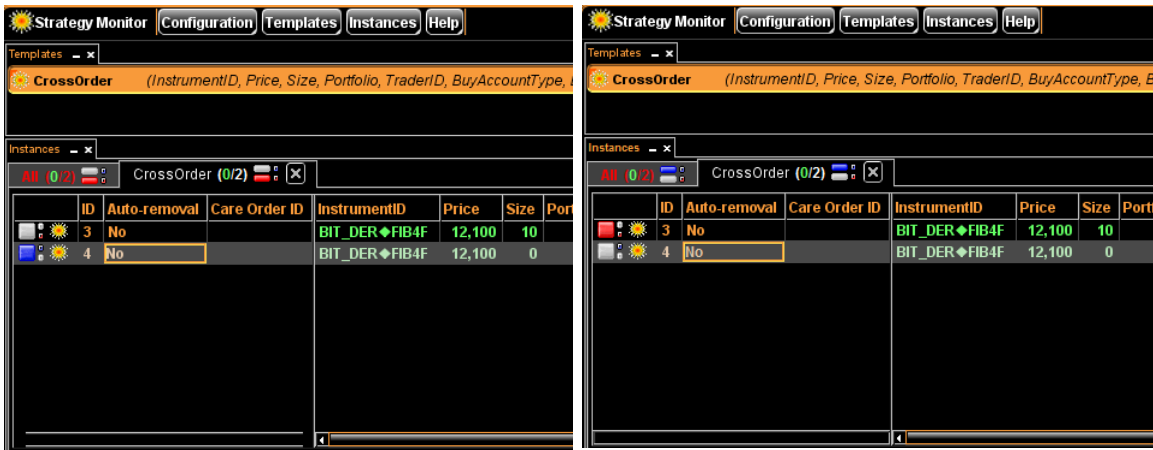


Alert or run-time error messages can be generated by the Strategy Service as long as a strategy instance is running. A blinking **blue** or **red** square icon at the left end of a row reveals the existence of, respectively, one or more **alert** messages or **run-time error** messages, as shown in the following pictures.

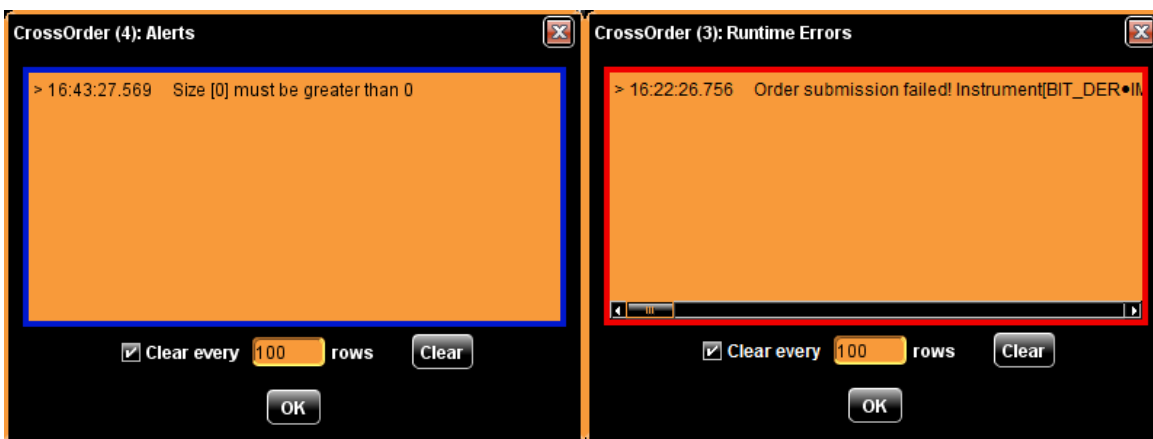
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By clicking the corresponding icon a message window pops up, thus showing all relevant messages, which can be possibly removed via the Clear button in the message window or by clicking the small top (alerts) or bottom (run-time errors) mini-icon at the right of the main icon in the **Instances** pane.

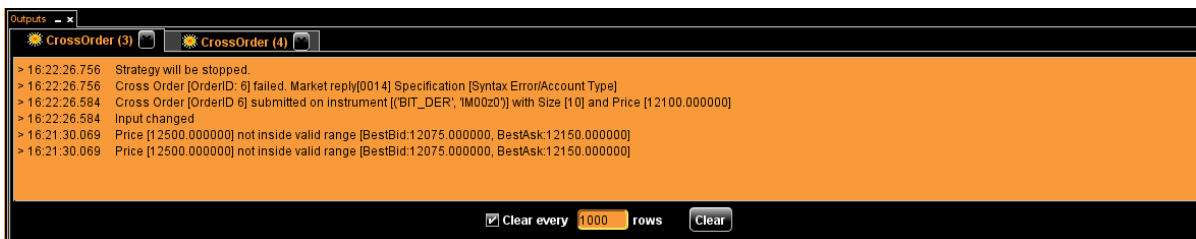


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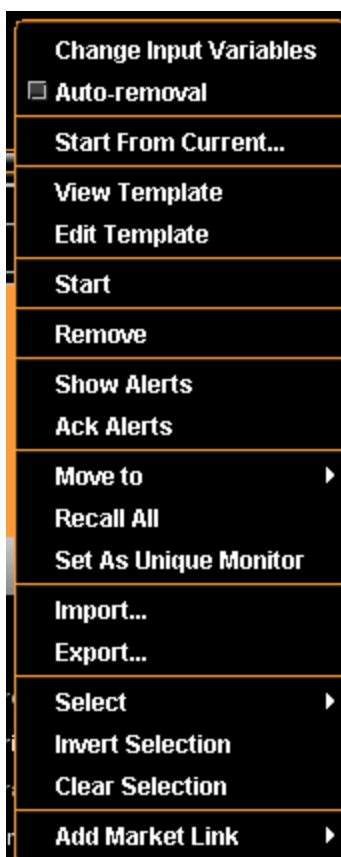
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Each strategy instance can log its internal steps onto a text pane in the **Outputs** pane in case the **View Output** box has been ticked at the bottom of the data entry window.



By right-clicking on the Strategy Monitor window a context-dependent drop-down menu is displayed. If a strategy instance has been previously selected by clicking, then the actions to be



performed in the drop-down menu refer to the strategy instance.

The meaning of some items is straightforward: in the following a description of all available options is provided.

Change Input Variables: it allows to modify some input parameters of a strategy instance, regardless of whether it is running or not (changes might not be applied to some input variables when a strategy instance is running);

Auto-removal: if this flag has been set for a strategy instance, in case the BTS[®] client application gets disconnected from the Strategy Service or the user logs out from BTS[®] client, the Strategy will be automatically stopped and active orders generated from the Strategy instance will be removed from the market. On the contrary, if this flag has not been set, the strategy instance will be kept running even if the BTS[®] client application has lost connection to the Strategy Service or the user logs out from BTS[®] client; moreover, if the Strategy Service stopped, the instance execution is resumed at the restart of the service;

Start From Current...: a new strategy instance can be created

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from an existing one with the same values of input variables, which can then be modified if needed;

View Output: it starts logging the internal steps of the strategy instance under execution onto a text pane in the **Outputs** pane (in case the **View Output** box had not been ticked yet at the bottom of the data entry window when starting the strategy instance);

View Template, Edit Template: these options are relevant to strategy developers and are out of scope in this document;

Start: it starts executing the strategy instance;

Stop: it stops executing the strategy instance;

Suspend: it suspends the execution of the strategy instance, which will still receive market data, but it will no longer send orders to the market;

Resume: it resumes the execution of the strategy instance;

Remove: it removes the previously stopped strategy instance from the Instances pane of the Strategy Monitor window;

Stop and Remove: it stops executing the strategy instance and removes it from the Instances pane of the Strategy Monitor window;

Remove: it removes the previously stopped strategy instance from the Instances pane of the Strategy Monitor window;

Show Alerts: it opens the Alerts message window showing alert messages (if any) related to the execution of the strategy instance;

Show Errors: it opens the Runtime Errors message window showing run-time error messages (if any) related to the execution of the strategy instance;

Ack Alerts: it acknowledges (and removes) all alert messages (if any) related to the execution of the strategy instance;

Ack Errors: it acknowledges (and removes) all run-time error messages (if any) related to the execution of the strategy instance;

Move To: it moves the selected strategy instance(s) to another existing Strategy Monitor window or to a new one;

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Recall All: it moves all strategy instances configured in any other Strategy Monitor window to the current Strategy Monitor window: the other Strategy Monitor windows will become empty;

Set As Unique Monitor: it moves all strategy instances configured in any other Strategy Monitor window to the current Strategy Monitor window and eventually closes all other Strategy Monitor windows;

Import: it exports the configuration data of a strategy instance to an ASCII file;

Export: it imports the configuration data of a strategy instance from an ASCII file;

Select: it selects either all strategy instances or running instances only in the active Strategy Monitor window;

Invert Selection: it unselects all previously selected strategy instances and selects all previously unselected strategy instances;

Clear Selection: it unselects all previously selected strategy instances;

Add Market Link: it allows adding some of the following live market data items to be displayed in the same row of the strategy instance:

- **Bid Size**
- **Bid Price**
- **Ask Price**
- **Ask Size**
- **Last Trade Price**
- **Last Trade Size**
- **Best Book Fields** (Bid Size, Bid Price, Ask price, Ask Size)
- **Last Trade Fields** (Last Trade Price, Last Trade Size)
- **All.**

If more instruments are defined in a strategy instance, the selection of a data item opens a dialog window in order to select one instrument only for that data item;

Remove Market Link: it allows removing live market data items assigned to the strategy instance:

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- any of existing data items
- **Best Book Fields** (Bid Size, Bid Price, Ask price, Ask Size)
- **Last Trade Fields** (Last Trade Price, Last Trade Size)
- **All.**

Please note **Create as 'Strategy user'** option (at the bottom of the data entry window) is not relevant for BTS[®] and must be left unchecked.

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4 CROSSORDER (AUTOMATIC CROSS ORDER) – Version 1.4

Strategy Goal

The goal of the **CrossOrder** (or “Automatic Cross Order”) strategy is to automatically submit a cross (internal) order to the IDEM market in order to report the execution of a trade in which both counterparties are represented by the single operator who enters the order: this action must be performed only when the price falls in the market price spread.

Cross orders can be traded through two different types of execution:

- **normal**
- **BTF (Block Trade Facility)**

For **normal** cross orders the set price must fall strictly within the current market price spread for the series relevant to the order, otherwise the order will be rejected. As regards **BTF** cross orders, in case the order size is greater than/equal to a set value (provided in market reference data), the set price can fall into a wider price spread than the one accepted by the IDEM market for normal cross orders. The quantity value and the associated price rules change on the basis of the instrument type, as shown in the table below:

Instrument Type	Price Validation Interval Best Bid-Ask Spread Plus/Minus
FTSE MIB Index Futures	1% [BestBidPrice -1%, BestAskPrice + 1%]
FTSE MIB Dividend Futures	2% [BestBidPrice - 2%, BestAskPrice + 2%]
Italian and Pan-European Stock Futures	10% [BestBidPrice - 10%, BestAskPrice + 10%]
FTSE MIB Options And Weekly MIBO	20% [BestBidPrice - 20%, BestAskPrice + 20%]
Stock Options	10%

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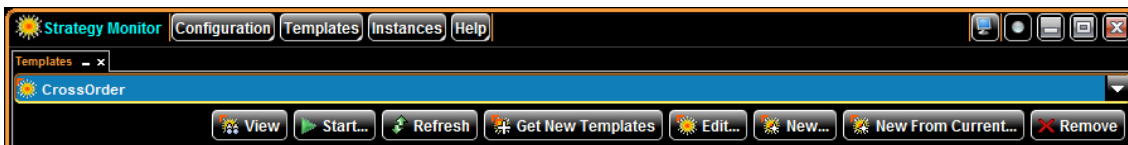
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[BestBidPrice - 10%, BestAskPrice + 10%]

N.B. Internal cross orders on MINIfib are not allowed by the IDEM market.

Strategy Start

In order to run an instance of the **CrossOrder** strategy the user must select the **CrossOrder** entry in the combo-box of the **Templates** pane in the **Strategy Monitor** window and press the **Start** button.



The data entry window below pops up so that the user can enter input data for the strategy instance:

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CrossOrder: Start [Close]

Input

InstrumentID

Price *

Size *

Portfolio

TraderID *

BuyAccountType *

BuyAccountTypeDS

SellAccountType *

SellAccountTypeDS

BuyClearingInstruction *

SellClearingInstruction *

BuyPositionEffect

SellPositionEffect

BuyOrderRef

SellOrderRef

Notes

ExchangeForPhysical

BuyPhysicalLeg

SellPhysicalLeg

BuyClientIdentification

SellClientIdentification

BuyInvestmentDecision

SellInvestmentDecision

Control

Schedule Server Start Up
 Server Shutdown

Create as 'Strategy User'

Auto-removal

View Output

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The following values must be entered by the user:

INPUT VARIABLE	MANDATORY	DESCRIPTION
InstrumentID	Y	Instrument identifier available through the platform Dictionary
Price	Y	Price of the cross order
Size	Y	Size of the cross order
Portfolio	N	Platform portfolio to which the order and trades will be assigned. If not specified, DEFPORTFOLIO will be used.
TraderID	Y	8-character market trader identifier made up by: <ul style="list-style-type: none"> • first 4 characters: Firm Identifier • last 4 characters: Trader Identifier
BuyAccountType	Y	Account type of the buy-side client: It must contain one of the following values: <ul style="list-style-type: none"> • House Trader • Agent Account
BuyAccountTypeDS	N	Account type description of the buy-side client
SellAccountType	Y	Account type of the sell-side client: It must contain one of the following values: <ul style="list-style-type: none"> • House Trader • Agent Account
SellAccountTypeDS	N	Account type description of the sell-side client
BuyClearingInstruction	Y	12-character account number of the buy-side client
SellClearingInstruction	Y	12-character account number of the sell-side client
BuyPositionEffect	Y	This data field indicates how the buy-side client's position will be handled by the clearing system. It must contain one of the following values:

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		<ul style="list-style-type: none"> • O: position is open • C: position is closed
SellPositionEffect	Y	<p>This data field indicates how the sell-side client's position will be handled by the clearing system. It must contain one of the following values:</p> <ul style="list-style-type: none"> • O: position is open • C: position is closed
BuyOrderRef	N	40-character text to be assigned to the buy-side trade
SellOrderRef	N	40-character text to be assigned to the sell-side trade
Notes	N	Free text
ExchangeForPhysical	Y	Delivery type involved in the transaction
BuyPhysicalLeg	N	20 char to be filled in case the Buy side is an Exchange for Physical
SellPhysicalLeg	N	20 char to be filled in case the Sell side is an Exchange for Physical
BuyClientIdentification	Y	Specifies the nature of the trading client submitting the cross on the Buy side (Client LEI/Natural Person)
ShortCode	Y	Identifier of the trading client submitting the cross on the Sell side (range 4- 4294967295)
SellClientIdentification	Y	Specifies the nature of the trading client submitting the cross on the Sell side (Client LEI/Natural Person)
ShortCode	Y	Identifier of the trading client submitting the cross on the Sell side (range 4- 4294967295)
BuyInvestmentIdentification	Y	Specifies the nature of the investment decision maker relevant to the cross order on the Buy side (Algorithm/ Natural Person)
ShortCode	Y	Identifier of the investment decision maker relevant to the cross order on the Buy side (range 4-

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		4294967295)
SellInvestmentIdentifica tion	N	Specifies the nature of the investment decision maker relevant to the cross order on the Sell side (Algorithm/ Natural Person)
ShortCode	N	Identifier of the investment decision maker relevant to the cross order on the Sell side (range 4-4294967295)

Strategy Validity Checks

In case one of the following checks has not been passed when starting a strategy instance, it will be stopped:

1. the instrument type is one of those listed in the **Strategy Goal** section;
2. the instrument is in the IDEM market reference data, complete with CFI code and underlying instrument;
3. all mandatory fields must not be empty;
4. order **Price** and **Size** must be greater than zero.

Strategy Behaviour

After starting an instance of the CrossOrder strategy, it first checks the state of the instrument and its market phase: in case the instrument is neither tradable nor in continuous trading, the strategy instance waits for a change in one of the two best prices in the order book to evaluate whether the state or the phase (or both) has changed. For the time being the strategy instance does not submit the cross order to the market.

In case the instrument is tradable and is in the continuous trading phase, the strategy instance checks the existence of a valid price spread in the order book of the selected instrument (as specified in the **Strategy Goal** section above): in case the order price does not fall in the current market price spread, no cross order is submitted to the market.

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In case the order cannot be submitted to the market due to unacceptable price and/or size values, the user can change any of them by selecting the strategy instance, right-clicking it and then choosing the **Change Input Variables** command, which brings up the data entry window. Once data values have been changed, pressing the OK button will make changes effective: if these new values now make the cross order acceptable to the market, it is submitted right away.

If the order price falls (or moves) into the current market price spread (as specified in the **Strategy Goal** section above) while the instrument is tradable and is in the continuous trading phase, the cross order entered by the user via the data entry window is submitted to the market: under this condition the cross order is no longer active in the market and the strategy instance automatically stops, with trades of both sides being notified to the originator member firm.

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5 INTERBANKORDER (AUTOMATIC INTERBANK ORDER) – Version 1.5

Strategy Goal

The goal of the **InterbankOrder** (or “Automatic Interbank Order”) strategy is to automatically submit a committed (interbank) order to the IDEM market in order to report the execution of a trade, the counterparty of which is a specific and predetermined intermediary: this action must be performed only when the price falls in the market price spread.

Committed orders can be traded through two different types of execution:

- **normal**
- **BTF (Block Trade Facility)**

For normal committed orders the set price must fall strictly within the current market price spread for the series relevant to the order, otherwise the order will be rejected. As regards **BTF** committed orders, in case the order size is greater than/equal to a set value (provided in market reference data), the set price can fall into a wider price spread than the one accepted by the IDEM market for normal interbank orders . The quantity value and the associated price rules change on the basis of the instrument type, as shown in the table below):

Instrument Type	Price Validation Interval Best Bid-Ask Spread Plus/Minus
FTSE MIB Index Futures	1% [BestBidPrice - 1%, BestAskPrice + 1%]
FTSE MIB Dividend Futures	2% [BestBidPrice – 2%, BestAskPrice + 2%]
Italian and Pan-European Stock Futures	10% [BestBidPrice – 10%, BestAskPrice + 10%]
FTSE MIB Options And Weekly MIBO	20% [BestBidPrice – 20%, BestAskPrice + 20%]
Stock Options	10%

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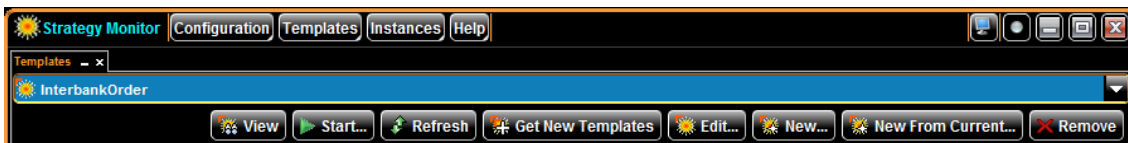
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[BestBidPrice – 10%, BestAskPrice + 10%]

N.B. Committed orders on MINIfib are not accepted by the IDEM market.

Strategy Start

In order to run an instance of the **InterbankOrder** strategy the user must select the **InterbankOrder** entry in the combo-box of the **Templates** pane in the **Strategy Monitor** window and then press the **Start** button.



The data entry window below pops up so that the user can enter input data for the strategy instance:

The following values must be entered by the user:

INPUT VARIABLE	MANDATORY	DESCRIPTION
InstrumentID	Y	Instrument identifier available through the platform Dictionary
Side	Y	Side of the committed order
Price	Y	Price of the committed order
Size	Y	Size of the committed order
Portfolio	N	Platform portfolio to which the orders and trade will be assigned. If not specified, DEFPORTFOLIO will be used.
Counterparty	Y	Code of the trade counterparty
TraderID	Y	8-character market trader identifier made up by: <ul style="list-style-type: none"> first 4 characters: Firm Identifier last 4 characters: Trader Identifier
AccountType	Y	Account type of the member firm: It must contain one

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		<p>of the following values:</p> <ul style="list-style-type: none"> • House Trader • Agent Account <p>Note: the values Market Maker and Non Segregated Account do not apply for IDEM market</p>
PositionEffect	Y	<p>This data field indicates how the member firm's position will be handled by the clearing system:</p> <ul style="list-style-type: none"> • Open: position is open • Close: position is closed
ClearingInstruction	Y	12-character account number of the member firm
OrderRef	N	40-character text to be assigned to the trade
Notes	N	Free text
ClientIdentification	Y	Specifies the nature of the trading client submitting the order (Client LEI/Natural Person)
ShortCode	Y	Identifier of the trading client submitting the cross on the order (range 4- 4294967295)
InvestmentIdentificati on	Y	Specifies the nature of the investment decision maker relevant to the order (Algorithm/ Natural Person)
ShortCode	Y	Identifier of the investment decision maker relevant to the order range 4- 4294967295)

Strategy Validity Checks

In case one of the following checks has not been passed when starting a strategy instance, it will be stopped:

1. the instrument type is one of those listed in the **Strategy Goal** section;
2. the instrument is in the IDEM market reference data, complete with CFI code and underlying instrument;
3. all mandatory fields must not be empty;

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4. order **Price** and **Size** must be greater than zero.

Strategy Behaviour

After starting an instance of the InterbankOrder strategy, it first checks the state of the instrument and its market phase: in case the instrument is neither tradable nor in continuous trading, the strategy instance waits for a change in one of the two best prices in the order book to evaluate whether the state or the phase (or both) has changed. For the time being the strategy instance does not submit the committed order to the market.

In case the instrument is tradable and is in the continuous trading phase, the strategy instance checks the existence of a valid price spread in the order book of the selected instrument (as specified in the **Strategy Goal** section above): in case the order price does not fall in the current market price spread, no committed order is submitted to the market.

In case the order cannot be submitted to the market due to unacceptable price and/or size values, the user can change any of them by selecting the strategy instance, right-clicking it and then choosing the **Change Input Variables** command, which brings up the data entry window. Once data values have been changed, pressing the OK button will make changes effective: if these new values now make the committed order acceptable to the market, it is submitted right away.

If the order price falls (or moves) into the current market price spread (as specified in the **Strategy Goal** section above) while the instrument is tradable and is in the continuous trading phase, the committed order entered by the user via the data entry window is submitted to the market and the strategy instance remains active.

Once a committed order is in the market, it stays there unless it is removed (e.g. by either the Market Surveillance or by a user - BTS[®] or non-BTS[®] - of the same member firm) or until a committed order of the same price and size, but opposite side, has been entered by a counterparty for the originator member firm: under any of these conditions the committed order is no longer active in the market and the strategy instance automatically stops, with a trade being notified to the originator member firm in the last case.

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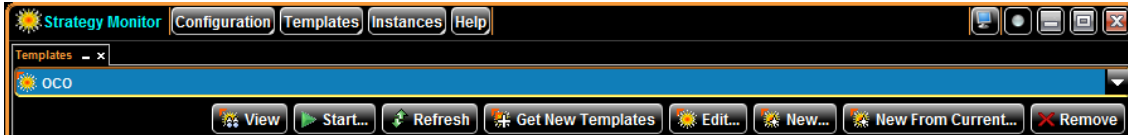
6 OCO (ORDER CANCELS ORDER) – Version 1.5

Strategy Goal

The goal of the OCO (“Order Cancels Order”) strategy is to protect an existing position in a derivative instrument *against adverse market* movements via a trigger order and, at the same time, to benefit from positive market changes via a standard or trigger order.

Strategy Start

In order to run an instance of the OCO strategy the user must select the **OCO** entry in the combo-box of the **Templates** pane in the **Strategy Monitor** window and then press the **Start** button.



The data entry window below pops up so that the user can enter input data for the strategy instance:

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Data items to be provided are listed in the following table along with market data used by the strategy instance:

INPUT VARIABLE	MANDATORY	DESCRIPTION
InstrumentID	Y	Instrument identifier available through the platform Dictionary

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TriggerCondition	Y	Market price of the selected instrument used in the condition that will trigger a take-profit or stop-loss order: <ul style="list-style-type: none"> • Bid: best bid price • Ask: best ask price • Last: last trade price
ProfitPrice	Y	Price of take-profit limit order if ProfitOrder = <i>Normal</i> or threshold in take-profit trigger condition and price of take-profit order if ProfitOrder = <i>Trigger</i> and TriggerType = <i>Limit</i>
StopPrice	Y	Threshold in stop-loss trigger condition and price of stop-loss order if TriggerType = <i>Limit</i>
Size	Y	Size of both stop-loss and take-profit orders
TriggerType	Y	Type of stop-loss and take-profit orders to be sent to the market: <ul style="list-style-type: none"> • Limit: limit order • AtAnyPrice: order at any price (the whole size must be matched even if at different prices, as opposed to a market order)
ProfitOrder	Y	Type of take-profit order to be sent to the market <ul style="list-style-type: none"> • Normal: limit order • Trigger: trigger order (limit trigger order if TriggerType = <i>Limit</i> or trigger order at any price if TriggerType = <i>AtAny Price</i>)
Side	Y	Side of both stop-loss and take-profit orders
Portfolio	Y	Platform portfolio to which the orders and trade will be assigned. If not specified, DEFPORTFOLIO will be used.
TraderID	Y	8-character market trader identifier made up by:

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		<ul style="list-style-type: none"> • first 4 characters: Firm Identifier • last 4 characters: Trader Identifier
AccountType	Y	<p>Account type of the member firm: It must contain one of the following values:</p> <ul style="list-style-type: none"> • House Trader • Agent Account <p>Note: the values Market Maker and Non Segregated Account do not apply for IDEM market</p>
PositionEffect	Y	<p>This data field indicates how the member firm's position will be handled by the clearing system:</p> <ul style="list-style-type: none"> • Open: position is open • Close: position is closed
ClearingInstruction	Y	12-character account number of the member firm
OrderRef	N	40-character text to be assigned to the trade
ClientIdentification	Y	Specifies the nature of the trading client submitting the order (Client LEI/Natural Person)
ShortCode	Y	Identifier of the trading client submitting the cross on the order (range 4- 4294967295)
InvestmentIdentification	Y	Specifies the nature of the investment decision maker relevant to the order (Algorithm/ Natural Person)
ShortCode	Y	Identifier of the investment decision maker relevant to the order range 4- 4294967295)

Strategy Validity Checks

In case one of the following checks has not been passed when starting a strategy instance, it will be stopped:

1. the instrument is in the IDEM market reference data, complete with CFI code and underlying instrument;

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2. all mandatory fields must not be empty;
3. **ProfitPrice**, **StopPrice** and **Size** must be greater than zero;
4. **ProfitPrice** must be less (greater) than **StopPrice** for when **Side** is set to BUY (SELL).

Strategy Behaviour

As soon as an instance of this strategy has been started, two concurrent orders are automatically submitted to the market for the selected **InstrumentID** if and only its status is active and it is in the continuous trading phase, otherwise the two orders are entered when the instrument moves into the continuous trading phase with active status. The strategy instance always submits a Stop Loss Trigger Order and a Take Profit Standard or Trigger Order with the following input values:

Stop Loss Order

- **stop-loss** trigger order at any price with **Side** and **Size** if **TriggerType** has been set to **AtAnyPrice**, **StopPrice** being the threshold price for the **TriggerCondition** market price in the trigger condition, or
- stop-loss trigger order with **Side**, **Size** and **StopPrice** if **TriggerType** has been set to **Limit**, **StopPrice** being the threshold price for the **TriggerCondition** market price in the trigger condition.

Take Profit Order

- limit order with **Side**, **Size** and **ProfitPrice** if **ProfitOrder** has been set to **Normal** (regardless of the value selected for **TriggerType**), or
- take-profit trigger order at any price with **Side** and **Size** if **ProfitOrder** has been set to **Trigger** and **TriggerType** has been set to **AtAnyPrice**, **ProfitPrice** being the threshold price for the **TriggerCondition** market price in the trigger condition, or
- take-profit trigger limit order with **Side**, **Size** and **ProfitPrice** if **ProfitOrder** has been

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set to **Trigger** and **TriggerType** has been set to Limit, **ProfitPrice** being the threshold price for the **TriggerCondition** market price in the trigger condition.

N.B. ProfitPrice must be less than StopPrice for buy orders or greater than StopPrice for sell orders. If not, the strategy will be automatically stopped.

A **Stop Loss** trigger order is triggered within the market when the trigger condition is matched by the current or new value of the **TriggerCondition** market price as shown below:

Trigger Order Type	Side	Market Price	Trigger Condition
Stop Loss	Buy	Best Ask Price	Best Ask Price \geq Trigger Price
Stop Loss	Buy	Best Bid Price	Best Bid Price \geq Trigger Price
Stop Loss	Buy	Last Trade Price	Last Trade Price \geq Trigger Price
Stop Loss	Sell	Best Ask Price	Best Ask Price \leq Trigger Price
Stop Loss	Sell	Best Bid Price	Best Bid Price \leq Trigger Price
Stop Loss	Sell	Last Trade Price	Last Trade Price \leq Trigger Price

Similarly, a **Take Profit** trigger order is triggered within the market when the trigger condition is matched by the current or new value of the **TriggerCondition** market price as shown below:

Trigger Order Type	Order Side	Market Price	Trigger Condition
Take Profit	Buy	Best Ask Price	Best Ask Price \leq Trigger Price
Take Profit	Buy	Best Bid Price	Best Bid Price \leq Trigger Price
Take Profit	Buy	Last Trade Price	Last Trade Price \leq Trigger Price
Take Profit	Sell	Best Ask Price	Best Ask Price \geq Trigger Price
Take Profit	Sell	Best Bid Price	Best Bid Price \geq Trigger Price
Take Profit	Sell	Last Trade Price	Last Trade Price \geq Trigger Price

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When a new trade has been executed for one of the two orders, the size of the other order is reduced accordingly by the trade size. Moreover, in case one of the two orders has been totally filled, the strategy instance automatically stops itself, then removing the other order from the market.

In case the user decides to change the size of one of the two orders, the same size is automatically assigned to the other order. Also, when one of the two orders is manually removed from the market, a warning message is issued by the strategy instance prompting the user to stop the strategy instance (left in an idle state) in order to remove the other order. The warning message, displayed both in the Alert window and in the **Outputs** pane of the Strategy Monitor window is shown below:

The screenshot displays the Strategy Monitor application window. The main area shows a table of active strategy instances. The table has columns for Template, ID, Auto-removal, InstrumentID, TriggerCondition, ProfitPrice, StopPrice, Size, TriggerType, ProfitOrder, Side, and AccountType. Two instances are listed: ID 404 and ID 405. The Outputs pane at the bottom shows a log of events, including the placement of a Stop Order and a Profit Order, and the start of the strategy.

Template	ID	Auto-removal	InstrumentID	TriggerCondition	ProfitPrice	StopPrice	Size	TriggerType	ProfitOrder	Side	AccountType
OCO	404	Yes	BIT_DER◆MINIGI	Last	18,010	18,020	100	AtAnyPrice	Trigger	Buy	Agent Account
OCO	405	No	BIT_DER◆FIB6L	Bid	17,720	17,740	200	Limit	Normal	Buy	Agent Account

Outputs - x

OCO (404)

```
> 09:16:01.925 Stop Order[ID 1614] placed on instrument [(\"BIT_DER\", \"1Y00z1\")] with Size [100.000000] Price [AtAnyPrice] TriggerPrice [18020.000000]
> 09:16:01.925 Profit Order[ID 1613] placed on instrument [(\"BIT_DER\", \"1Y00z1\")] with Size [100.000000] Price [AtAnyPrice] TriggerPrice [18010.000000]
> 09:16:01.925 Strategy started
```

Clear every 1000 rows

Finally, in case the user decides to stop the strategy instance, both orders are automatically removed from the market.

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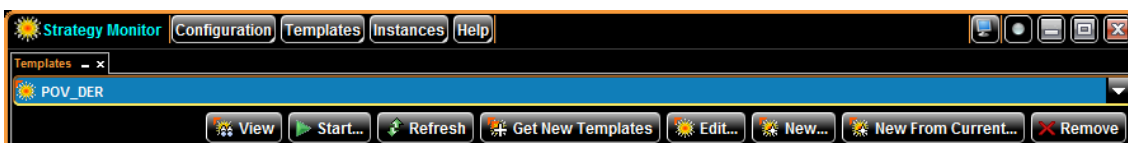
7 POV_DER (PERCENTAGE OF VOLUME - DERIVATIVES) - Version 2.0

Strategy Goal

Goal of the POV_DER ("Percentage Of Volume for Derivatives") strategy is to match a user-specified percentage of the overall volume traded in the IDEM market for the selected instrument. The optional price limit prevents a strategy instance from sending an order above (below) a given price for a buy (sell). A strategy instance executes trades in a specific time interval, with respect to which it keeps updating the market VWAP (Volume Weighted Average Price) for the current instrument (possibly including public cross trades when required) along with the user's VWAP and the deviation of the latter from the former in order to monitor performance. Within the above mentioned time interval a strategy instance will stop at market closure or once it has matched the maximum size entered by the user.

Strategy Start

In order to run an instance of the POV_DER strategy the user must select the **POV_DER** entry in the combo-box of the **Templates** pane in the **Strategy Monitor** window and then press the **Start** button.



The data entry window below pops up so that the user can enter input data for the strategy instance:

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POV_DER: Start

Input

StartTime: 08:57:34
EndTime: 17:40:00
Instr: [Field]
PrcLmt: Price NA NA
Side: Buy Sell
Size: Size NA NA
MaxVolPerc: [Field]
PriceType: Pegged Market
ModOrd_m: [Field]
SendOrd_s: [Field]
CrossTrade:
Prtfl: DEFPORTFOLIO
TraderID: [Field]
AccountType: [Field]
PositionEffect: Open
ClearingInstruction: [Field]
Customer: [Field]
OrderRef: [Field]
MktOrdDelay_ms: 1,000
ClientIdentification: [Field]
InvestmentDecision: [Field]

Control

Care Order ID: [Field]

Schedule
from Server Start Up to Server Shutdown
from 09:57:34 to 09:57:34

Create as 'Strategy User'
 Auto-removal
 View Output

Ok Save Cancel

The following values must be entered by the user:

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INPUT VARIABLE	MANDATORY	DESCRIPTION
StartTime	Y	Start time of the operational interval. If later than current time, the latter will be used as start time N.B. To be expressed in GMT/BST (not earlier than 08:00)
EndTime	Y	End time of the operational interval N.B. To be expressed in GMT/BST (not later than 16:40)
Instr	Y	Instrument identifier available through the platform Dictionary
PrcLmt	N	Price limit to prevent the strategy instance from sending orders above (below) a certain price for a buy (sell)
Side	Y	Side of orders to be sent to the market
Size	Y	Cumulative size limit of orders to be sent to the market
MaxVolPerc	Y	Percentage of the overall volume traded for the current instrument to be matched (e.g. 10 means 10%)
PriceType	Y	PriceType for orders to be sent to the market: <ul style="list-style-type: none"> • Pegged (order is first entered at best price, to be eventually changed into market order if still in the market after ModOrd_m minutes) • Market (default – order is entered as market order)
ModOrd_m	Y	Time interval (expressed in minutes) at the end of which any active order is changed into a market order (if PriceType = <i>Market</i>) or a reverse-pegged order (if PriceType = <i>Pegged</i>)
SendOrd_s	Y	Time interval (expressed in seconds) at the end of which a new order may be sent to the market in order to

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INPUT VARIABLE	MANDATORY	DESCRIPTION
		match MaxVolPerc % of the overall size executed so far in the market by all participants within the StartTime – EndTime time interval
CrossTrade	Y	On/off check box. If ticked, all public cross trades are included when calculating market VWAP for current instrument in selected time interval
Prtfl	Y	Platform portfolio to which the order and trades will be assigned. If not specified, DEFPORTFOLIO will be used.
TraderID	Y	8-character market trader identifier made up by: <ul style="list-style-type: none"> • first 4 characters: Firm Identifier • last 4 characters: Trader Identifier
AccountType	Y	Account type of the member firm: It must contain one of the following values: <ul style="list-style-type: none"> • House Trader • Agent Account Note: the values Market Maker and Non Segregated Account do not apply for IDEM market
PositionEffect	Y	This data field indicates how the member firm's position will be handled by the clearing system: <ul style="list-style-type: none"> • Open: position is open • Close: position is closed
ClearingInstruction	Y	12-character account number of the member firm
Customer	N	Platform-specific identifier of customer for third-party orders
OrderRef	N	40-character text to be assigned to the trade
MktOrdDelay_ms	Y	Time interval (expressed in milliseconds) at the end of which all active orders are changed into pegged orders

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INPUT VARIABLE	MANDATORY	DESCRIPTION
ClientIdentification	Y	Specifies the nature of the trading client submitting the order (Client LEI/Natural Person)
ShortCode	Y	Identifier of the trading client submitting the cross on the order (range 4- 4294967295)
InvestmentIdentificati on	Y	Specifies the nature of the investment decision maker relevant to the order (Algorithm/ Natural Person)
ShortCode	Y	Identifier of the investment decision maker relevant to the order range 4- 4294967295)

Strategy Validity Checks

In case one of the following checks has not been passed when starting a strategy instance, it will be stopped:

- the instrument is in the IDEM market reference data, complete with CFI code and underlying instrument;
- all mandatory fields must not be empty;
- **EndTime** must be later than **StartTime**.

Strategy Behaviour

An instance of **POV_DER** strategy is active within the **StartTime** – **EndTime** time interval (**both times to be set in GMT**). If **StartTime** is earlier than current time, the latter will be used as start time; on the contrary, if **StartTime** is later than current time, the strategy instance will be idle until **StartTime** has not been reached.

As long as the selected instrument is in continuous trading, every **SendOrd_s** seconds the total size executed by the strategy instance is compared with **MaxVolPerc** % of the overall size (possibly including public cross trades if the **CrossTrade** checkbox has been ticked) executed so far in the market by all participants within the **StartTime** – **EndTime** time interval: if the former is less than the latter and the instrument is tradable, the balance (rounded to the size

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tick of the current instrument) becomes the size of a new pegged order to be sent to the market. As regards the price of each new pegged order it is the current Best Bid (Ask) price for a BUY (SELL) order: in case the user assigned a value to the **PrcLmt** variable, the price of a BUY (SELL) order cannot be greater (less) than **PrcLmt**: once in the market, the price of the order does no longer change.

Each active limit order is periodically checked so that, if it has been in the market for at least **ModOrd_m** minutes, it is removed from the market in order to be replaced by a market order of the same side and size if **PriceType** has been set to ***Market***; on the contrary, in case **PriceType** has been set to ***Pegged***, each active order is changed into a reverse-pegged order, i.e. its price is set to the current Best Ask (Bid) price for a BUY (SELL) order. In case the user has assigned a value to the **PrcLmt** variable, the price of a BUY (SELL) order cannot be greater (less) than **PrcLmt**.

In case some of the orders previously changed into market orders or reverse-pegged orders are still active in the market after **MktOrdDelay_ms** milliseconds, all of them are changed into pegged orders: the price of each new pegged order will be the current Best Bid (Ask) price for a BUY (SELL) order. In case the user assigned a value to the **PrcLmt** variable, the price of a BUY (SELL) order cannot be greater (less) than **PrcLmt**. Once in the market, the price of each order is no longer changed.

Every time that the selected instrument resumes continuous trading (e.g. after an intraday volatility auction) each active order is newly pegged to the current best price: the price of each new pegged order will be the current Best Bid (Ask) price for a BUY (SELL) order. In case the user has assigned a value to the **PrcLmt** variable, the price of a BUY (SELL) order cannot be greater (less) than **PrcLmt**. Once in the market, the price of each order is no longer changed.

In case the **Size** value is changed by the user while the strategy instance is still running and the new value is equal to/greater than the total size executed so far by the strategy instance, all active orders will be removed from the market and the strategy instance ends up in an idle state.

As long as the strategy instance is running, it keeps updating the market VWAP for the

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current instrument related to the **StartTime** - **EndTime** time interval on the basis of public trades (possibly including public cross trades if the **CrossTrade** checkbox has been ticked) along with the **MyVWAP** value based on the trades executed by the strategy instance and the deviation of the latter from the former in order to monitor the performance of the strategy instance. In case the total size executed by the strategy instance has reached the Size value before **EndTime**, neither VWAP, nor **MyVWAP** will be any longer updated.

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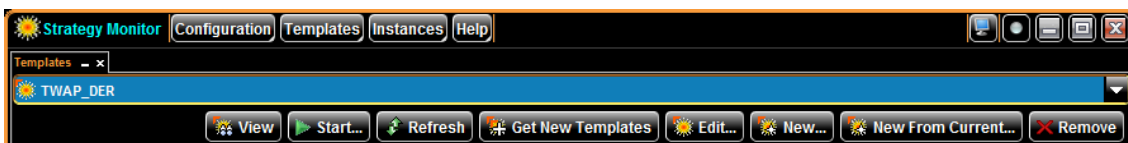
8 TWAP_DER (TIME-WEIGHTED AVERAGE PRICE - DERIVATIVES) – Version 2.1

Strategy Goal

Goal of the TWAP_DER (“Time-Weighted Average Price for Derivatives”) strategy is to manage a large order for a derivative instrument within a given time interval in order to minimize market impact by splitting the overall size into small size orders on a time basis. This can be accomplished by operating in two different ways (**Automatic** o **Manual**) as requested by the user.

Strategy Start

In order to run an instance of the TWAP_DER strategy the user must select the **TWAP_DER** entry in the combo-box of the **Templates** pane in the **Strategy Monitor** window and press the **Start** button.



The data entry window below pops up so that the user can enter input data for the strategy instance:

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TWAP_DER: Start

Input

StartTime: 10:07:22
EndTime: 17:40:00
ExecMode: Automatic Manual
Instr:
PrcLmt: Price NA NA
Side: Buy Sell
Size: Size NA NA
PriceType: Pegged Market
SendOrd_s:
CrossTrade:
Prtfl: DEFPORFOLIO
TraderID:
AccountType:
PositionEffect: Open
ClearingInstruction:
Customer:
OrderRef:
MktOrdDelay_ms: 1,000
ClientIdentification:
InvestmentDecision:

Control

Care Order ID:

Schedule

from Server Start Up to Server Shutdown
 10:07:22 10:07:22

Create as 'Strategy User'
 Auto-removal
 View Output

Ok Save Cancel

The following values must be entered by the user:

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INPUT VARIABLE	MANDATORY	DESCRIPTION
StartTime	Y	Start time of the operational interval. If later than current time, the latter will be used as start time N.B. To be expressed in GMT (not earlier than 08:00)
EndTime	Y	End time of the operational interval N.B. To be expressed in GMT (not later than 16:40)
ExecMode	Y	Operational mode: <ul style="list-style-type: none"> • Automatic (order frequency computed by the strategy instance) • Manual (order frequency based on SendOrd_s value)
Instr	Y	Instrument identifier available through the platform Dictionary
PrCLmt	N	Price limit to prevent the strategy instance from sending orders above (below) a certain price for a buy (sell)
Side	Y	Side of orders to be sent to the market
Size	Y	Cumulative size limit of orders to be sent to the market
PriceType	Y	PriceType for orders to be sent to the market: <ul style="list-style-type: none"> • Pegged • Market (default)
SendOrd_s	N	Order frequency expressed in seconds (used only for ExecMode set to Manual)
CrossTrade	Y	On/off check box. If ticked, all public cross trades are included when calculating market VWAP for current instrument in selected time interval
Prtfl	Y	Platform portfolio to which the order and trades will be

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INPUT VARIABLE	MANDATORY	DESCRIPTION
		assigned. If not specified, DEFPORTFOLIO will be used.
TraderID	Y	8-character market trader identifier made up by: first 4 characters: Firm Identifier last 4 characters: Trader Identifier
AccountType	Y	Account type of the member firm: It must contain one of the following values: <ul style="list-style-type: none"> • House Trader • Agent Account Note: the values Market Maker and Non Segregated Account do not apply for IDEM market
PositionEffect	Y	This data field indicates how the member firm's position will be handled by the clearing system: <ul style="list-style-type: none"> • Open: position is open • Close: position is closed
ClearingInstruction	Y	12-character account number of the member firm
Customer	N	Platform-specific identifier of customer for third-party orders
OrderRef	N	40-character text to be assigned to the trade
MktOrdDelay_ms	Y	Time interval to receive possible trades after changing the order price in order to hit the opposite side of the order book (PriceType = Pegged)
ClientIdentification	Y	Specifies the nature of the trading client submitting the order (Client LEI/Natural Person)
ShortCode	Y	Identifier of the trading client submitting the cross on the order (range 4- 4294967295)
InvestmentIdentification	Y	Specifies the nature of the investment decision maker relevant to the order (Algorithm/ Natural Person)

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INPUT VARIABLE	MANDATORY	DESCRIPTION
ShortCode	Y	Identifier of the investment decision maker relevant to the order range 4- 4294967295)

Strategy Validity Checks

In case one of the following checks has not been passed when starting a strategy instance, it will be stopped:

1. the instrument is in the IDEM market reference data, complete with CFI code and underlying instrument;
2. all mandatory fields must not be empty;
3. **EndTime** must be later than **StartTime**;
4. **SendOrd_sec** must be assigned when **ExecMode** has been set to **Manual**.

Strategy Behaviour

An instance of the TWAP_DER strategy is active within the **StartTime** – **EndTime** time interval: **both times must be set in GMT/BST**. If **StartTime** is earlier than current time, the latter is used as start time; on the contrary, if **StartTime** is later than current time, the strategy instance will be idle until **StartTime** has not been reached.

The strategy behaviour varies depending on the **ExecMode** operational mode (**Automatic** or **Manual**) set by the user. Every **SendOrd_s** seconds a new order is sent to the market with size set to **OrderSize**, which is determined by partitioning the overall Size entered by the user and rounding it to the **Size Tick** of the current instrument. In **Manual ExecMode** the value of the **SendOrd_s** variable is the one entered by the user when starting the strategy instance, whereas in **Automatic ExecMode** the order frequency is computed by the strategy instance. Here follow details on the values computed by the strategy instance in the two **ExecModes** along with some examples.

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ExecMode = *Manual*

1. **DeltaTime** = **EndTime** – **StartTime** (expressed in seconds)
2. **SendOrd_s** (entered by the user)
3. **NumOrders** = **DeltaTime** / **SendOrd_s**
4. **OrderSize** = **Size** / **NumOrders**

In case the size of a single order (**OrderSize**) is not an exact multiple of the Size Tick of the instrument, the possible size balance gets removed and will be added to the size of the next order: under this condition it may happen that an order is not sent to the market every **SendOrd_s** seconds.

	Example 1	Example 2	Example 3
StartTime	10:00:00 GMT	10:00:00 GMT	10:00:00 GMT
EndTime	12:00:00 GMT	12:00:00 GMT	12:00:00 GMT
DeltaTime	7200	7200	7200
Size	360	40	1200
SendOrd_s	5	300	60
NumOrders	$7200 / 5 = 1440$	$7200 / 300 = 24$	$7200 / 60 = 120$
OrderSize [Size Tick = 1]	$360 / 1440 = 0,25$ 1° order: 0,25 => 0 2° order: 0,25 + 0,25 = 0,5 => 0 3° order: 0,25 + 0,50 = 0,75 => 0 4° order: 0,25 + 0,75 = 1	$40 / 24 = 1,66$ 1° order: 1,66 => 1 2° order: 1,66 + 0,66 => 2.32 => 2 3° order: 1.66 + 0,32 = 1,98 => 1	$1200 / 120 = 10$

ExecMode = *Automatic*

DeltaTime = **EndTime** – **StartTime** (expressed in seconds)

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SendOrd_s = DeltaTime / Size

The **SendOrd_s** value computed by the strategy instance is never less than 10 seconds.

NumOrders = DeltaTime / SendOrd_s

OrderSize = Size / NumOrders

In case the size of a single order (**OrderSizer**) is not an exact multiple of the size tick of the instrument, the possible size balance gets removed and will be added to the size of the next order: under this condition it may happen that an order is not sent to the market every **SendOrd_s** seconds.

	Example 1	Example 2	Example 3
StartTime	10:00:00 GMT	10:00:00 GMT	10:00:00 GMT
EndTime	12:00:00 GMT	12:00:00 GMT	12:00:00 GMT
DeltaTime	7200	7200	7200
Size	40	1440	10000
SendOrd_s	$7200 / 40 = 180$	$7200 / 1440 = 5 \Rightarrow 10$	$7200 / 10000 = 0,72 \Rightarrow 10$
NumOrders	$7200 / 180 = 40$	$7200 / 10 = 720$	$7200 / 10 = 720$
OrderSize [Size Tick = 1]	$40 / 40 = 1$	$1440 / 720 = 2$	$10000 / 720 = 13,88$ 1° order: $13,88 \Rightarrow 13$ 2° order: $13,88 + 0,88 = 14,76 \Rightarrow 14$ 3° order: $13,88 + 0,76 = 14,64 \Rightarrow 14$

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Every **SendOrd_s** seconds the strategy instance sends an order to the market with **OrderSize** size, whereas price has been determined on the basis of the value of the **PriceType** variable.

PriceType = *Pegged*

- order price is “reverse pegged” to the Best Price in the order book, i.e. equal to the current Best Ask Price if **Side** has been set to **Buy** or equal to the current Best Bid Price if **Side** has been set to **Sell**. Even if the relevant Best Price will change in the future, the order price will not be updated. In case the user entered a value for the **PrcLmt** variable, the order price is the lower value between the Best Ask Price and **PrcLmt** if **Side** was set to **Buy**, whereas it is the greater value between the Best Bid Price and **PrcLmt** if **Side** was set to **Sell**.

PriceType = *Market*

- order price is market price (i.e. empty). In case the user entered a value for the **PrcLmt** variable, the order will be sent to market only if the Best Ask Price is not greater than **PrcLmt** for **Side** set to **Buy**, or if the Best Bid Price is not less than **PrcLmt** for **Side** set to **Sell**.

If one or more orders in the market have not been fully executed yet 1 minute (value hardcoded in the strategy) after being entered, each one undergoes a “forced” execution procedure, the behaviour of which varies on the basis of the value of the **PriceType** variable:

PriceType = *Market*

- the remaining size of the order is removed from the market and re-entered via a market order in **AtAnyPrice** mode.

PriceType = *Pegged*

the order price is changed in order to hit the opposite side of the order book (price set to the current Best Ask Price if **Side** is **Buy** or to the current Best Bid Price if **Side** is **Sell**). If the remaining size has not been fully executed, the order price is modified again after **MktOrdDelay_ms** seconds (time interval to receive possible trades after the price change) so

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as to make it “pegged” to the Best Price of the same side.

As long as the strategy instance is running, it keeps updating the market VWAP for the current instrument related to the **StartTime** - **EndTime** time interval (possibly including public cross trades if the **CrossTrade** checkbox has been ticked) along with the MyVWAP value and the deviation of the latter from the former in order to monitor the performance of the strategy instance.

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