



US Options Risk Management Specification

Version 1.1.6

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1 Introduction

1.1 Overview

BATS' Options Risk Management has been designed to assist BATS members in managing the risk of over-executing. Members can design a risk profile that defines execution limits as a function of time or absolute limits. These rules can be applied to unique OSI (Options Symbology Initiative) Roots that they trade, or as Firm level limits. When these limits are reached, executions will stop, outstanding orders will be cancelled, new orders rejected, and members can control when they are willing to trade again.

1.2 Certification

BATS Options Members must certify with the [BATS Trade Desk](#) prior to using these Risk Management features.

1.3 Risk Limit Types

Risk limits are defined by OSI Root or at the Firm level. For each Firm and/or OSI Root a collection of limits may be defined. These rules work in conjunction until one of the limits is reached, at which point trading will stop, open orders will be cancelled, and any new orders received will be rejected. Both the cancel and the reject will carry a specific reason code that allows members to identify that an OSI root risk limit or a Firm risk limit has been reached.

Limit Type	Description
Rate Based Notional	<p>Notional is computed as the sum of the products of premium multiplied by number of contracts. For example if 2 executions occurred, one for 5 contracts at \$3, and one for 7 contracts at \$2, then the notional would be computed as:</p> $(5 * \$3) + (7 * \$2) = \$29$ <p>Rate based notional limits are defined by the two parameters <i>notional value</i> and <i>number of milliseconds</i>. Any time the notional value executed exceeds the notional value specified within the specified number of milliseconds, the limit is triggered.</p>
Rate Based Volume	<p>Volume is computed as the sum of the number of contracts executed. When the total number of contracts executed exceeds the specified value within the specified number of milliseconds, the limit is triggered</p>
Rate Based Count	<p>Count is computed as the number of executions. Premium and number of contracts have no bearing on this computation. If a member specified a limit of 10 executions per second, then an attempt to execute the 11th execution within a single second will fail, cancellations will be issued, and rejects of new orders will occur.</p>
Absolute Notional	<p>The absolute notional behaves similarly to rate based notional limits with the exception that time is not considered. If 'X' dollars in notional have been executed the limit is reached,</p>

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	<p>cancel orders are issued and new orders are rejected until the member has a chance to assess and decide to reset.</p>
Absolute Volume	<p>Similar to rate based volume with the exception that time is not considered. If 'X' contracts have been executed, the limit is reached, cancel orders are issued, and new orders are rejected until the member has a chance to assess and decide to reset.</p>
Absolute Count	<p>The absolute count behaves similarly to rate based count limits with the exception that time is not considered. If 'X' executions have been executed the limit is reached, cancel orders are issued and new orders are rejected until the member has a chance to assess and decide to reset.</p>

1.3.1 Limit Execution Details

1.3.1.1 OSI Root

While these risk management tools are designed for and generally used for protection with regards to *posted* liquidity, the same risk configurations can impact the activity of remove and/or routed flow, if a member sends routed flow through BATS. BATS will make every effort to stop executions as close to the limit as possible. OSI Roots will be distributed across four (4) matching units split between calls vs. puts and front two (2) months vs. trailing months. OSI level rules are precise, excluding routed orders, for limits that are triggered on a particular matching unit while best efforts are made to stop executions on the remaining three (3) matching units associated with an OSI Root. The table that follows describes the different scenarios that may be encountered and should help members to understand exactly what to expect in the context of OSI Root risk violations.

Limit Type	Execution Type	
	Matched	Routed
Rate Based Count Absolute Count	<p>Precise limits are controlled, where partials and full fills each count as one execution. If the member specifies a limit of 10 trades, it is guaranteed that an 11th matched trade will not occur within the specified time interval on the target matching unit. In this situation, best efforts would be made to prevent additional matched trades on the other three (3) matching units associated with the OSI root.</p>	<p>If there are multiple outstanding orders <i>that have been routed away</i> ALL may execute! While BATS will apply routed executions to your profile, your theoretical limit is equal to the number of matched executions plus open away orders. For example, suppose your limit is 10 executions per second and you have 8 that have occurred plus 3 open orders that have been routed to an away exchange. If all three execute at the away exchanges, your risk limit will have been reached at 11 executions instead of 10.</p>

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Limit Type	Execution Type	
	Matched	Routed
Rate Based Volume Absolute Volume	Similar to the limits for counts, volume control on matched orders is exact.	Similar to the limits for counts, precise limits cannot be controlled <i>when routable orders are entered</i> . The theoretical limit is equal to the current execution volume plus open away order volume.
Rate based Notional Absolute Notional	<p>Notional volume is guaranteed not to exceed your limit, but may be triggered short of the notional value desired. This is best understood through the following example:</p> <p>Suppose your limit is \$1,000 per minute and you have currently executed \$980. You have an order on the books for 3 contracts at \$7. If this order is hit, BATS cannot execute all 3 contracts because BATS would exceed your limit (\$1,001). 2 contracts (<i>totaling \$14</i>) will be executed and the limit will be triggered. Your notional value executed would be \$994 ($\\$970 + \\$14$).</p>	Like the other types, routed executions will always be open to the potential for exceeding your limit by an amount equal to the notional value in open orders that have been routed to an away exchange that exceeds the remaining unused value in your limit. For example, suppose your limit is \$1,000 and you have executed \$950. Furthermore assume there is \$100 in notional open orders that have been routed to an away exchange. You may reach \$1,050 before your limit is triggered.

1.3.1.2 Firm Level Rules

While OSI Root level rules will be precise for matched trades and best efforts for routed flow, firm level rules are always best efforts.

1.3.2 Supported Order Types

All order types are supported. Any order of any kind submitted to BATS that has been executed either fully or partially will decrement remaining values in a particular risk rule. As described above, routable orders can result in exceeding your OSI limits, and any execution can exceed your Firm limits.

Orders with minimum quantity specified may conflict with your OSI risk limits. In such cases, risk limits take priority. An example follows:

- You have a risk profile that specifies an absolute volume limit of 1000 contracts on OSI ZVZT. You have executed 950 contracts.
- You place an order for 200 contracts with a minimum quantity of 100.
- You can now only be executed for 50 shares because once your risk limit is reached. The risk limit takes priority over your minimum quantity settings.

1.4 FIX – Cancel, Rejects and Resets

When a resting order or inbound order is executed and a risk profile limit is reached, resting orders are cancelled and inbound orders are rejected. In both cases FIX Tag 58 (Text) will carry either a value of 's: RiskMgmtSymLevel' or 'f:RiskMgmtFirmLevel'.

When this is seen by a member it indicates that any order still in flight, and any new orders issued, will be rejected. Once a member has analyzed the situation and decides to commence trading, they must issue an order that has a special tag to clear the risk trigger. The tag is the 'RiskReset' tag which has been assigned to FIX Tag 7692. This tag must be filled with one of the following values:

- 'SYMBOL' to reset the risk profile associated with the OSI Root on the order.
- 'FIRM' to reset the firm level risk.
- 'BOTH' to reset both firm level risk and OSI risk with the OSI Root on the order.

For more information on FIX Tag 7692, refer to the [BATS US Options FIX Specification](#).

Note that a reset will reset all active rules within the profile for the given OSI Root and/or firm. Individual rules cannot be reset on their own. The example that follows demonstrates this behavior:

Suppose that a member has the following three rules in their profile for all contracts on MSFT:

1. 500 contracts per second
2. 20,000 contracts per minute
3. \$100,000 Absolute Notional

Suppose that at a particular instant in time the current state of the rules is as follows:

1. 400 contracts have been executed in the active second
2. 19,000 contracts have been executed in the active minute
3. \$25,000 notional value has been executed.

Next, an inbound order from another BATS member is received that triggers a potential execution for 200 contracts against the member owning the described risk profile. The execution is limited to 100 shares as the result of triggering the 500 contracts per second limit.

The member owning the risk profile issues a reset. At this point in time, all rules are reset. This means that the active state for all three rules is set back to ZERO, including the absolute notional rule. The absolute value executed of \$25,000 is lost and \$100,000 is again available for execution.

1.5 Ports and Profiles

Risk management profiles are associated with executing firm IDs assigned by BATS. If a member desires a specific profile for a collection of ports, then it is up to that member to use the proper value in the 'onBehalfOf' field of their order.

That being said, the flexibility exists to allow for a customer to have two different profiles on a single port, multiple ports on a single profile, or one profile per port. Members will have to design their profiles and work with the BATS Trade Desk to activate the proper executing firm IDs on the desired ports.

2 BATS Risk Management Profile

BATS offers members the ability to upload risk profiles through its Member Web Portal. The Web Portal is accessed through the public website at <http://www.batsoptions.com/>. To be applicable for the current trading day, profile files must be uploaded prior to 9AM ET (*effective 5/18/12*). Profiles uploaded after 9AM ET will not be applied until the next trading day.

2.1 BATSOPTIONS.COM Web Portal

Members of BATS can request a login to the BATS Member Web Portal from the BATS Trade Desk. After logging into their Web Portal account, users with appropriate access will be able to select the **Risk Management** link under Options Tools in the lower left menu of their account page.



Selecting this link will take the member to the tool defined in Section 2.4 “Using the Risk Management Profile Tool”.

2.2 File Format

The file format used for uploading a new profile or downloading a copy of an active file is identical. Each line of the file represents a rule containing a comma separated list of fields. The fields are described in the example that follows:

```
executing_firm_id, limit_type, osi_root, limit_value, time_limit,  
firm_level_limit, call/put, front/trailing month,
```

- `executing_firm_id` – As discussed in Section 1.4, this is a value assigned by BATS that is passed through on every order in the ‘onBehalfOf’ field. It controls the designated clearing relationship as well as the risk management profile that applies to this order.
- `limit_type` – The limit type is one of the following six values:
 1. `rate_ntnl` - A rate based notional limit.
 2. `rate_vol` - A rate based volume limit.
 3. `rate_count` - A rate based count limit.
 4. `abs_ntnl` - An absolute notional limit.
 5. `abs_vol` - An absolute volume limit.
 6. `abs_count` - An absolute count limit.
- `osi_root` – The OSI Root for the series, such as ‘MSFT’. If call/put and front/trailing month fields are not present then it is assumed any `osi_root` limits will be evenly applied to all 4 matching units associated with the particular `osi_root`. Note that this is not always equivalent to the underlying equity symbol.
- `limit_value` – This value must be an integer value. Floating point values are not accepted. When the limit type is a notional type, this represents whole

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dollars. When the limit type is a volume type, this represents cumulative contracts traded in an OSI Root. When the limit is a count type, this represents an execution count.

- `time_limit` – This field is ignored when the limit type is an absolute type. For rate types, this represents the number of milliseconds in the window. Values of less than 100 milliseconds will be treated as 100 milliseconds. In other words, the minimum time frame is 1/10th of a second.
- `firm_level_limit` – This field is optional. If present and the value is 'T' then it is assumed that you are requesting a Firm level rule. The OSI Root column should be blank in this case. If this column is present and has a value of T, and an OSI Root is specified, the rule will be rejected. Conversely, if an OSI Root is left blank and this field is not present or has a value other than 'T', the Firm level rule will be rejected.
- `call/put` – This field is optional, but if set must be accompanied by front/trailing month field. If present the value 'C' would identify Calls and 'P' would identify Puts.
- `front/trailing month` – This field is optional, but if set must be accompanied by call/put field. If present the value 'F' would identify Front 2 Months and 'T' would identify Trailing Months.

2.3 Multiple Rules

Multiple Firm rules and rules per OSI Root are allowable. There is a limit of 6 rules per OSI root per matching unit and 10 Firm rules. An example use of multiple rules is shown below.


A member may decide that they are comfortable with a notional value of \$100 per second. However, they are not comfortable with this rate as a sustainable long term rate. The five minute value that a member is comfortable with may be \$5,000 per five minutes. This rate is substantially slower than \$100 per second. This combination of rules would allow for a maximum burst execution rate limit while maintaining a longer term control at a much lower rate. Finally, a member may decide that in addition to these two rules, they never want a sum total of more than 10,000 executions without having a chance to analyze what's happening. A third rule, an absolute count rule, may also be introduced.

2.4 Using the Risk Management Profile Tool

During trading hours, uploads are not available. A download of your active rules will always be available. The screen show below shows a sample of this configuration screen that is available through the BATS Web Portal.

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Risk Management

 Enter executing firm id or ALL

Upload Risk File

File:

Upload section unavailable during market hours

Download Risk File

Download always available. Download all profiles or just a specific executing_firm_idEnter executing firm id or ALL

File Upload Content Sample

```
rate_ntrl,osi_root,1000000,1000
rate_vol,osi_root,1000000,1000
rate_count,osi_root,1000000,60000
abs_ntrl,osi_root,1000000,250
abs_vol,osi_root,1000000,1000
abs_count,osi_root,1000000,60000
```

** Note... If the number of milliseconds is not specified, it will default to 0 milliseconds.*

Prior to 7AM ET the upload section will apply to current day. Uploads after 7AM ET will be applied to the next trading day. Note that no dates are contained in the file and you cannot stage future profiles beyond the next trading session. You can only replace the active profile with a new one for the next trading session. Once a profile is activated, it stays active permanently until a new profile is loaded.

3 Contact Details

If you have any questions or would like to begin using BATS Risk Management, please contact your account manager or any of the teams below:

Sales

sales@batstrading.com

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Trade Desk

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Revision History

Document Version	Date	Description
1.0.0	10/08/10	Initial Version 1.0.0.
1.1.0	06/28/11	Added support for Firm level risk checks. Added Limit Netting.
1.1.1	08/30/11	Updated limit type definitions under File Format section for Limit Netting. Updated number of OSI and Firm rules allowed.
1.1.2	11/16/11	Removed support for Limit Netting. Added support for call/put and front/trailing month options to the Risk Management Profile File Format.
1.1.3	01/18/12	Cleaned up the ordering of Section 2.2 File Format.
1.1.4	03/05/12	Clarification added to <code>osi_root</code> definition in Section 2.2 File Format.
1.1.5	05/08/12	Corrected cut-off time for Profile uploads to note uploads after 7AM ET will not be applied until the next trading day. Removed references indicating profiles could not be uploaded between 9AM – 4PM ET. Upload support during this timeframe will be made available <i>effective 5/11/12</i> .
1.1.6	05/14/12	Profile uploads will be applicable to current day if received by 9AM ET <i>effective 5/18/12</i> .