
NASDAQ NORDIC
Genium INET Pre-trade Risk Management
Service Guide 2.2



DOCUMENT SCOPE

This document describes the NASDAQ Nordic Genium INET Pre-Trade Risk Management (PRM) service, offered by NASDAQ Stockholm AB. It details the steps to complete to order the service, prepare for its use in production and the procedure for its support and configuration management.

PRM is offered as an additional service under NASDAQ Nordic Derivatives Rules and terms not defined in this document shall have the same meaning as set forth in the derivatives rules.

DOCUMENT HISTORY

Date	Revision	Change Description
2013-03-13	1.0	Document created
2013-04-25	2.0	Updates to document layout, pricing info and next version updates added and other minor updates/additions.
2013-06-10	2.1	Updates to PRM support section.
2016-08-25	2.2	Updates: New users may be automatically and intraday added to a default PRM group Maximum trade report size is a new limit in the PRM Possibility to set limits for specific combination classes and types

GENIUM INET PRM

BACKGROUND

In today's marketplaces there is an increased focus on risk management and specifically on pre-trade risk management in relation to new market access models such as Sponsored Access (SA) and Direct Market Access (DMA).

At the same time speed of response and latency are getting more and more important, especially when algorithmic and program trading methodologies form the base of a customer's business.

As the leader in trading and data technology for the financial industry, NASDAQ has developed a Pre-Trade Risk Management service that provides customers of its Nordic marketplace a Pre-Trade Risk Management solution that virtually adds no latency.

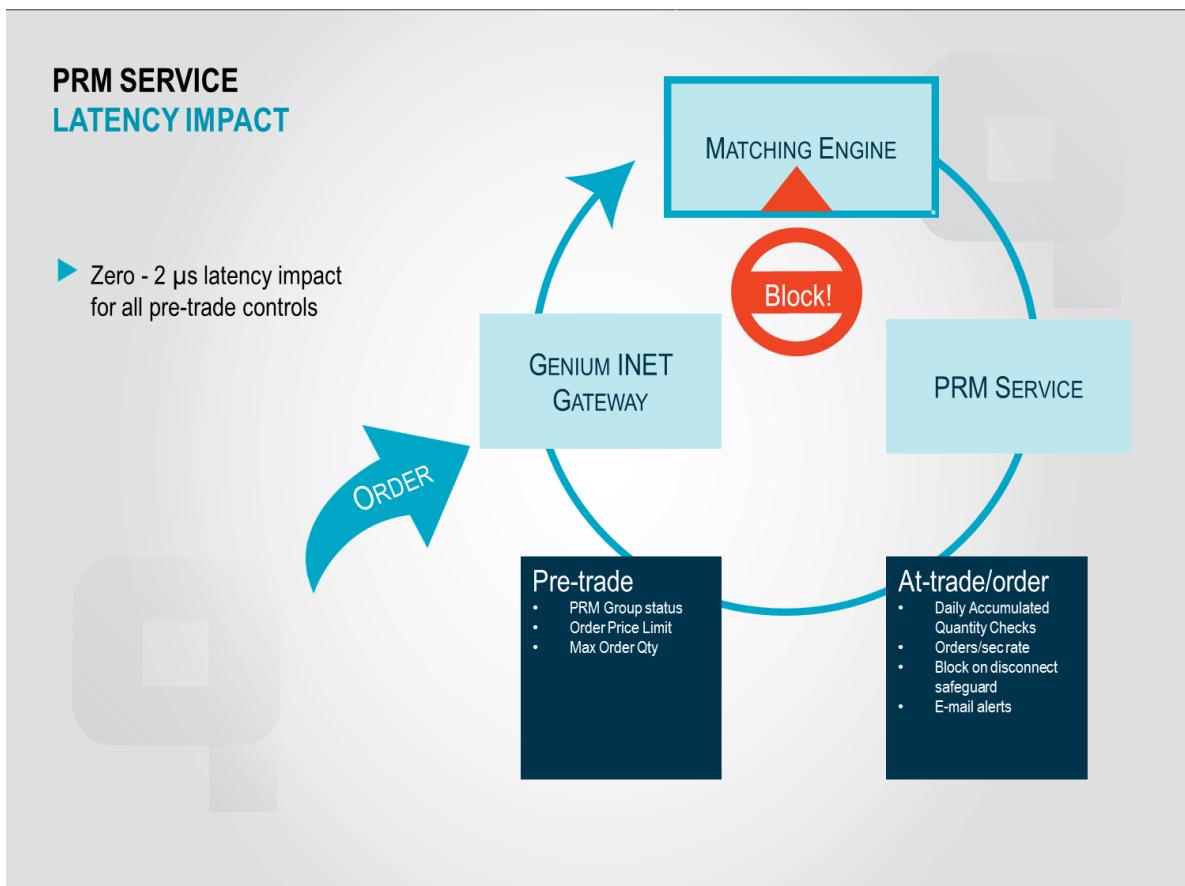


* Order Price Limit functionality is separate from PRM and is set market wide for all participants by the exchange.

OVERVIEW

The PRM service provides member firms with the ability to facilitate pre-trade protection.

Using PRM, member firms can set various constraints on orders and control their trading activity and the trading activity of their clients and customers, including prevention of potentially erroneous transactions.



Fat finger price check is not part of the PRM service. It will be provided via the Order Price Limit functionality as a market wide functionality. I.e. it will be centrally (by the Exchange) set limits and applicable for all participants.

The PRM service consists of a number of at-trade risk checks and a pre-trade risk check that can be combined in a flexible way. The pre-trade risk check validates orders prior to allowing them into the matching engine. The at-trade/at-order-entry risk checks validate orders after insertion and are implemented directly in the Genium INET trading system based on the internal real-time stream of data. As soon as a trade or an order has breached any of the at-trade risk check limits, the PRM service will immediately block the affected account.

When orders are rejected, the PRM service provides customers with clearly defined reasons for rejection.

A PRM User Interface (UI) is available that provides members with the ability to directly control and update all their risk limits including the ability to quickly mass cancel orders and block order flow.

Notifications via e-mail can be generated by the PRM service to alert customers about warning levels being reached or limits being breached.

KEY BENEFITS

- + **Speed.** PRM is fast, adding virtually no latency to order roundtrip time.
- + **Accuracy.** PRM functionality includes real-time price information to ensure that the most accurate information is available for validating orders regarding the Order Price Limits functionality.
- + **Flexibility.** PRM is flexible and manages protection on one or many account levels.

LATENCY

The PRM software is an integrated part of the code of Genium INET Nordics. When the PRM service is enabled, it means that extra lines of code are executed (i.e. the PRM checks) by the process handling incoming orders.

As the execution of PRM checks does not access external processes nor requires access to the network, the impact of a typical PRM configuration with all pre-trade controls activated, is less than 2 microseconds on the roundtrip latency.

GCM-NCM RELATIONS & SA CLIENTS

The PRM service is particularly suited for General Clearing Members (GCM) who offers direct market access to their Non Clearing Members (NCM), as well as for members who offer clients Sponsored Access or low-latency DMA. It fulfills the requirements for pre-trade control towards their NCMs and SA clients.

The PRM service offer a automatic block of order flow at disconnect safeguard function where the host would automatically block NCMs or SA clients in the same way as if a limit is breached, in the case where the host loses its connection.

SERVICE OFFERING

The PRM service provides:

1. Maximum Order Quantity Checks per PRM Group and Tradable
2. Daily Accumulated Quantity Checks per PRM Group and Tradable
3. Order Rate Checks per PRM Group
4. User defined Trading Restrictions
5. Manual blocking of order flow per PRM Group
6. Mass Cancellation of open orders per PRM Group
7. Automatic blocking of order flow at disconnect safeguard
8. Notifications via e-mail for risk limit breaches and warning levels
9. User Interface for administering risk limits, users and e-mail alerts, view risk checks consumption, mass cancel orders and block order flow.
10. API (via OMnet) support administering risk limits, users and e-mail alerts

Reject reasons will apply according to OMnet and FIX protocol specifications.

GENERAL DEFINITIONS

PRM Groups

A PRM Group is comprised of a group of user IDs connected to the same Participant ID. A PRM Group can therefore cover the whole order flow of a member or just the orders submitted by a set of users.

A PRM Group can only be connected to one Participant ID and a User ID can only belong to one PRM Group.

Active checks and their limits are configured per PRM Group as described in the next sections. It is not possible to create and activate a PRM Group intra-day nor is it possible to remove users from a group intra-day. New users may be automatically and intraday added to a default PRM group for the sponsored client if the user is linked to a participant that is linked to a PRM group which is tagged as default

Tradables

All type of checks except maximum orders/sec rate is configurable per Instrument Type or Class level, including combination classes and types, referred to as Tradables. Configured checks on a Class take precedence over those configured on the corresponding Type (if any). E.g. it's possible to have one general configuration for Swedish Stock Call Options and a specific configuration for Ericsson B Call Options.

Examples of Types	Examples of Classes
SWEDISH INDEX FUTURE	OMX STOCKHOLM 30 FUTURE OMXS BENCHMARK GI FUTURE
SWEDISH OMX INDEX CALL OPTION	OMX STOCKHOLM 30 CALL OPTION
SWEDISH INDEX WEEKLY CALL OPTION	OMXS30 WEEKLY CALL OPTION
SWEDISH STOCK CALL OPTION	ABB LTD CALL OPTION ALFA LAVAL CALL OPTION ...
SWEDISH STOCK PUT OPTION	ABB LTD PUT OPTION ALFA LAVAL PUT OPTION ...
SWEDISH STOCK FORWARD	ABB LTD FORWARD ALFA LAVAL FORWARD ...
SWEDISH STOCK FUTURE	ABB LTD FUTURE ALFA LAVAL FUTURE ...
INDEX FUTURE	OMXS30 FUTURE SWAP OMXSB FUTURE SWAP
TM COMBO SE INDEX	TM COMBO OMXS30
TM COMBO SE STOCK	TM COMBO ABB

MAXIMUM ORDER QUANTITY CHECK

Maximum Order Quantity Check is a pre-trade risk check that provides Members with the ability to check order quantity against a pre-set value for a PRM Group, e.g. if the order quantity is set to be max 10 000 and an order equals or exceeds 10 000 contracts, it will be rejected.

Different Maximum Order Quantity checks can be set on different Pre-Trade Limits Groups for the same Participant ID. Therefore, it is possible to assign different limits to different Users within a Participant ID as long as the Users are assigned to different Pre-Trade Limits Groups.

Different Maximum Order Quantity thresholds can be specified per Tradable. As an example, Members could request that for OMXS30 futures the maximum order size should be less than 5 001 contracts while for OMXS30 options the limit should be less than 10 001 contracts.

The maximum Order Quantity validation will only be performed at order entry and order alteration. Thus, the system will not re-validate long orders at the beginning of each trading day, nor will re-loaded orders in connection to a cold re-start of the system.

Orders in Combination Order Books are handled differently depending of the composition of the leg contracts. Different types of instruments are defined as Monthly Call Option, Monthly Put Option, Weekly Call Option, Weekly Put Option, Binary Call Option, Binary Put Option, Forward and Future.

Type of Combination	Examples	Max Order Quantity Check
All leg contracts are of the same type of instrument and share the same underlying security.	Calendar Spreads, Vertical Spreads, Ratio Spreads, Butterflies, Condors	Net exposure is validated against the specified limit in the applicable instrument. If zero net exposure no validation is done.
Leg contracts are not of the same type of instrument.	Straddles, Strangles, Risk Reversals, Options against Futures	The exposure in each leg contract is validated against the corresponding limit for the instrument.

MAXIMUM TRADE REPORT SIZE CHECK

Maximum Trade Report Size Check is a pre-trade risk check that provides Members with the ability to check trade report quantity against a pre-set value for a PRM Group, e.g. if the trade report quantity is set to be max 10 000 and a trade report equals or exceeds 10 000 contracts, it will be rejected with the same return code in the reject message as when an order is rejected because the max order size limit was breached.

To have trade report sizes validated a Pre Trade Limits Group needs to be set as default receiver, e.g. on a participant ID it is possible to set several PRM groups but for the purpose of maximum trade report size one group shall be set as the default whereby all trade reports registered on the participant ID will be validated against the limits set on the default group. If no PRM group is set as default trade reports will not be validated against any maximum trade report size. This is valid for two-sided trade reports and trade reports entered by the Exchange. Single-sided trade reports are checked towards the PRM group limits for which the user belongs to.

For multi-leg trade reports, each leg will be validated individually against the maximum trade report size limit.

If the maximum trade report size check is in breach, new trade reports in that tradeable will be rejected.

DAILY ACCUMULATED QUANTITY CHECKS

The daily accumulated checks are at-trade/at-order-entry risk checks that involve monitoring of a series of counters for each Tradable.

Different checks can be set on different PRM Groups for the same Participant ID.

Therefore, it is possible to assign different limits to different User IDs within a Participant ID as long as the User IDs are assigned to different Pre-Trade Limits Groups.

Limits are individually configured for each Tradable and PRM Group for the following gross counters:

Open Orders Buy and Sell counters	Maximum total quantity of Buy orders/Sell orders in the market per Tradable
Traded Bought and Sold counters	Maximum total quantity of the Bought position/Sold position per Tradable
Traded Net counter	Absolute value of Traded Bought – Traded Sold per Tradable
Total Buy and Sell counter	Sum of Open Buy (Sell) orders and Traded Bought (Sold) counter per Tradable
Total Net Buy and Sell counter	Total Net Buy = Traded Bought – Traded Sold + Open Buy orders per Tradable Total Net Sell = Traded Sold – Traded Bought + Open Sell orders per Tradable

Breaching an Accumulated Quantity Limit

When an Accumulated Quantity limit for a Tradable is breached, the PRM Group is blocked (i.e. new orders and modifications are rejected) for all the order books traded on the affected Tradable, but can still cancel open orders. Users connected to the concerned PRM Group will still be allowed to enter orders on order books traded on other Tradables until their respective Accumulated Quantity Limits are breached. If the accumulated quantity for the breached counter is decreased below the specified limit (e.g. by deleting open orders), the PRM Group is automatically unblocked.

Please note that if no action is taken when a limit is breached, and if no automatic unlock is carried out, on the next trading day the PRM Group will be unlocked and allowed order entry in the concerned Tradable.

Please be advised that the PRM service is NOT designed to automatically cancel open orders (and thereby preventing future executions of orders already residing on the book) once a limit is breached. The PRM service will only prevent new orders from being accepted; previous orders in the matching engine before the limit was surpassed can still be executed or cancelled.

An incoming order that breaches a Daily Accumulated Quantity limit will always be accepted by the Trading System and will be the signal for the rejection of following orders in order books traded on the affected Tradable. For this reason, Members are advised to always set a limit for the Maximum Order Quantity to control by how much an Accumulated Quantity Check limit could be breached by an incoming breaking order.

For more information on how the Accumulated Quantity Checks work please refer to Appendix A – Examples on Daily Accumulated Quantity Checks.

Limitations

Members are encouraged to consider the limitations stated below when defining the limits for the quantity based checks:

- + All the accumulated quantities are counted for each individual Tradable only and therefore there are no global cross-Tradable counters available.
- + Combinations only affect the counters as described below:
 - Combinations are broken down in their individual legs and the size of the individual legs shall be added to the counters of the Tradables of the individual legs of the combination.
 - For combinations where the same Tradable is both bought and sold in different legs, the buy and sell quantities shall be netted and only the surplus shall be added to the Open Order Buy/Sell and Traded Bought/Sold counters.
- + For Mass Quotes the maximum order quantity check is performed per transaction. This means that the maximum quantity a user can add via one Mass Quote transaction is always $2 * \text{MaxSize} * \text{Maximum Nbr Of Quote Items}$. E.g. with a MaxSize of 51, an optimized mass quote (OMnet message MO96, max 37 items), it's possible to add 3700 ($2*50*37$) contracts regardless of any active daily accumulated quantity checks.
- + Already resting Stop Orders can be triggered and traded after a PRM Group has been blocked.
- + The accumulated checks are only support for Listed Derivatives

ORDER RATE CHECK

The maximum order rate/sec limit is defined as new orders/second and is set per PRM Group and is measured as the combined order flow for all users connected to that group.

The order rate is based on information received after order insertion (post order validation). Thus, it is possible that orders that are above the configured limit will be accepted and inserted to the order book.

The limit shall be expressed in per a 1 second order rate and the PRM service is checking the order rate every 1/10 of a second. If the order rate for the last 1/10 of a second equals or exceeds 1/10 of the configured order rate limit when the PRM service check is done, a breach will occur and the group is blocked on all tradables.

The goal with this control is to capture abnormal aggregated order/sec rates resulting from orders submitted via a Pre-Trade Limits Group.

It is not possible to set different max order/sec limit per Tradable.

Should the limit be breached, the following actions will be taken for the affected Pre-Trade Limits Group:

- + The Pre-Trade Limits Group will be blocked and new orders will be rejected for the actual Pre-Trade Limits Group
- + It will still be possible to cancel open orders

A block of a PRM Group as a result of an order rate breach must be unblocked manually, once the root cause of the excessive order generation has been identified and resolved.

The Order Rate Check is based on new orders inserted into the book. If an order is traded at entry it will also count towards the Order Rate limit. The following examples will be ignored by the Order Rate Check:

- + Order Cancel Requests
- + Order types that do not stay in the book, such as IOC or FOK (except in auctions where they do stay in the book)
- + Rejected orders
- + Order modifications

For Mass Quotes the maximum orders/sec check is done per item and side, meaning that a limit of 100 orders/sec will only allow the user to enter 5 double sided items per transaction without being blocked.

Stop Orders are validated against the Maximum Orders/sec when triggered, and not at entry.

RESTRICTED INSTRUMENTS

By default, users within a PRM Group are allowed unrestricted trading in all instruments where no limits have been set up.

Enabling restricted instruments for a PRM Group, changes the default behavior. If enabled, users will be allowed to trade only the instruments for which limits have been configured.

The Restricted Instruments check is performed pre-trade within the matching engine.

BLOCK/UNBLOCK

It's possible to manually block/unblock a PRM Group using the PRM UI.

Users of a blocked PRM Group are:

- + Not allowed to enter new orders nor alter existing orders
- + Able to delete existing orders
- + Allowed to login
- + Allowed to receive broadcasts, send queries, thus being able to view the market

A manually blocked PRM Group can be unblocked intra-day manually with the PRM UI, or if nothing is done then the PRM Group will be unblocked automatically the next day.

Automatic Block at Disconnect Safeguard

For each PRM Group, it is possible to store one User ID that will be monitored by the system. If the monitored user loses its connection, an event is generated to block all PRM Groups associated to it in the same way as if they were blocked manually. The affected PRM Groups must then be manually unblocked when the monitored user is active again.

Please note that the monitored User ID should never be used to log into the PRM UI.

Instead it's typically a trade drop and/or order flow consumer used by the member's risk monitoring software.

ON-BEHALF OF OPERATIONS BY EXCHANGE OFFICIALS

It is possible to assign order and trade consumption coming from orders entered on-behalf of a Participant by the Exchange Brokers to one of the PRM Groups configured for that Participant by selecting it as 'default PRM Group'.

WARNINGS & NOTIFICATIONS OF BREACHES

The PRM service can automatically send e-mail alerts to a list of pre-defined recipients connected to a PRM Group in the following cases:

- + When a limit is breached
- + For position risk parameters there are two additional levels that can be configured to generate emails:
 - A notification level (percentage of limit) that is configurable per PRM Group
 - A warning level (percentage of limit) that is configurable per PRM Group

Not more than one each of the notification, warning and breach emails will be generated per day per PRM Group, Tradable and type of risk check. I.e. one notification, one warning and one breach email for every configured limit will be sent per day.

If a limit is changed intra-day, the counter is reset, meaning that one notification, warning and breach email will be allowed for that specific limit check regardless of what emails have been sent before.

Please note: As the Order Rate limit is blocked hard (i.e. it requires a manual unblock by the sponsor), a new email will be generated each time the Order Rate limit is breached.

The PRM e-mail notification service is provided on a best effort basis and NASDAQ makes no guarantee as to e-mail delivery.

Examples of the subject of PRM e-mail notifications:

Breach Event, Group: SEXXX_SEXXX_PRM1, Risk Check: TRADED_NET (4), Time: Fri Feb 15 09:23:16 CET 2013, Event Level: BREACH, Consumed: 53, Limit: 50

Breach Event, Group: SEXXX_SEXXX_PRM1, Risk Check: OPEN_BUY (0), Time: Thu Feb 14 09:03:06 CET 2013, Event Level: BREACH, Consumed: 55, Limit: 55

Breach Event, Group: SEXXX_SEXXX_PRM1, Risk Check: TOTAL_NET_BUY (7), Time: Wed Feb 13 13:17:18 CET 2013, Event Level: BREACH, Consumed: 200, Limit: 151

TRADING SESSION STATES

All checks are active during all trading sessions.

PRM ADMINISTRATION

PRM User Interface

NASDAQ Nordic provides PRM Customers with a PRM UI. The interface allows PRM customers to:

- + Define PRM Groups and PRM Checks
 - Configure Tradeables and the associated limits for each PRM Check
 - Define restricted instruments
 - Add/remove Users to a PRM Group
 - Add or change monitored user for a PRM Group
- + View the current consumption of each quantity check in real-time
- + Intraday emergency Block/unblock order flow for a PRM Group
- + Cancellation of all open orders for a PRM Group
- + Identify any breached limit
- + Unblock a PRM Group that has breached the limit for maximum order/sec
- + Administrate e-mail addresses to receive alerts and warnings

The PRM UI is also available as read-only limiting the access to only view the PRM check's consumption.

GCMs and members offering clients Sponsored Access can create and administrate both their own PRM Groups, and groups connected to their NCMs and SA clients with the same UI.

For detailed information about the PRM UI and how to use it, please read the Genium INET PRM User Interface Guide available at:

<http://nordic.nasdaqomxtrader.com/memberextranet/>

OMnet API

The OMnet API allows PRM customers to:

- + Define PRM Groups and PRM Checks
 - Configure Tradeables and the associated limits for each PRM Check
 - Add/remove Users to a PRM Group
 - Add or change monitored user for a PRM Group
- + Administrate e-mail addresses to receive alerts and warnings

The configuration is done using the DC90 message (Set Pre Trade Limit) and updates to configuration are broadcasted via the BU90 message (Pre Trade Limit Update).

Intraday and Next Day Changes

The following table shows what changes can be made intraday or for the next day.

CHANGE	Intraday	Next Day
Update the quantity check limit values	X	
Update the Order Rate limit	X	
Select restricted instruments	X	
Add an email address to a PRM Group notification list	X	
Update an email address of a Pre-Trade Limits Group notification list	X	
Update the warning and notice percentages on a PRM Group	X	
Add/Remove Tradable to a PRM Group		X
Change the calculation unit on a tradable		X
Remove an e-mail address from a PRM Group notification list		X
Create or delete a PRM Group		X

PRICING

Pricing is according to the Technical Price list available at:

<http://nordic.nasdaqomxtrader.com/memberextranet/>

APPLICATION & GO-LIVE PROCESS

- + Compile and submit the Genium INET PRM request form to Member Services (ms.gi@nasdaq.com). Forms available at <http://nordic.nasdaqomxtrader.com/memberextranet/>. Customers shall submit separate forms for production and external test.
- + Configure and test the PRM functionality and limits in the external test environments.
- + Customers and ISVs that wish to use its own software to configure the PRM limits via OMnet should contact Technical Support (technicalsupport@nasdaq.com) for conformance testing and certification.
- + Configure and start using Genium INET PRM in Production.

PRM SUPPORT

Once the Member's PRM configuration is active in production, for technical support contact: technicalsupport@nasdaq.com or call +46 8 405 6750.

In the remote event that the PRM UI is not available Members can contact Trading Operations on telephone +46 8 405 7360 to perform an emergency suspension of its own Participant ID, or its sponsored Participant IDs. When a Participant is suspended all of its active orders are suspended, and quotes are deleted. During such event, Trading Operations can also block specific PRM Groups and support mass cancellations for specific PRM Groups on request by Members. Following a block or mass cancellation request a ticket have to be created with Technical Support for the technical issue.

CONTACTS

Functional support and emergency suspensions

Trading Operations
+46 8 405 7360
tradingoperations@nasdaq.com

Access & Connectivity

Member Services
+46 8 405 6660
ms.gi@nasdaq.com

Technical support

+46 8 405 6750
technicalsupport@nasdaq.com

Product information

Your Key Account Manager or <http://www.nasdaqomx.com/nordicprm/>

APPENDIX A – EXAMPLES ON DAILY ACCUMULATED QUANTITY CHECKS

Calculation unit: Quantity

Risk Limits

MaxSize	TradedBought	TradedSold	TotNetBuy	TotNetSell
51	1,500	1,500	151	151

The PRM Group will neither be able to have a net traded exposure of more than 200 contracts in any direction, nor will it be able to buy or sell more than 1,550 contracts during a day.

The PRM Group has three orders of 50 contracts on each side of the book and is not breaching any limit.

- + Example 1 - entering bid of 50 contracts in order book
 - The order is accepted but TotNetBuy is immediately breached, and the PRM Group is blocked until 50 contracts of ask quantity have been traded or if bid quantity is cancelled down to 150 contracts.
- + Example 2 – enter and fill 50 contacts
 - The order is accepted but TotNetBuy is immediately breached, and the PRM Group is blocked until 50 contracts of ask quantity have been traded or if bid quantity is cancelled down to 100 contracts.

The PRM Group has now bought 1,350 contracts and sold 1,350. It has four orders of 50 contracts on the bid side of the book, and three orders of 50 contracts on the offer. It is breaching the TotNetBuy limit and is currently blocked.

- + Example 3 - bids of 200 contracts are filled
 - The PRM Group is now also breaching the TradedBought limit and the PRM Group will remain blocked even if all 150 contracts on the offer are filled and the TotNetBuy is un-breached (at that point the TradedSold limit will be breached as well).