

ACCOUNT-BASED RISK FEATURE GUIDE

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Account-Based Risk

Overview

What Is Account-Based Risk?	<p>Account-based risk allows TT User Setup administrators to configure risk limits for a particular account, or to place multiple account numbers into a single account group and configure risk checking for the group as a whole. This includes:</p> <ul style="list-style-type: none"> • Controlling the maximum order size of a single order, the worst-case maximum long or short positions that can be attained per product and/or contract, and the worst-case sum of all long or short contracts per product • Defining margin limits, per account or account group, that apply to individual TT Gateways • Controlling whether users can change account numbers on fills • Enabling or disabling risk checking • Enabling or disabling trading per product <p>Additionally, TT User Setup administrators can:</p> <ul style="list-style-type: none"> • Control whether users can submit orders with accounts not configured in TT User Setup • Limit X_RISK administrators to specific accounts for Manual Fill and Start-of-Day publishing
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How Do I Enable Account-Based Risk?	<p>By default, account-based risk checking is disabled and no account groups exist. No account or account group risk checking will take place until risk checking is enabled and the gateways have been upgraded. This will allow administrators to configure new limits without impacting their current setups.</p> <p>To enable for account-based risk:</p> <ol style="list-style-type: none"> 1 Use TT User Setup to create accounts, and optionally, account groups. For more information refer to the section called Creating and Configuring Accounts and Account Groups. 2 Within the account or account group, configure product and margin limits as needed. For more information refer to the section called Configuring Account-Based Limits in TT User Setup. 3 Configure the account-based risk-related user settings. For more information refer to the Managing Account-Based Risk-Related User Settings in TT User Setup and Configuring Manual Fill and Start-of-Day Records by Account sections. 4 Upgrade the related TT products as needed to support the configured account-based risk features. Refer to the section called What Other TT Software Should I Upgrade?. 5 Ensure that <code>Auto-Calculate-SODs</code> is enabled on the gateways in order to have traders start each session with account-based positions.
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Note: Back-Office-Bridge is not compatible with account-based Start-of-Day records. If you require Start-of-Day records with account numbers, you should enable `Auto-Calculate-SOD` on the TT Gateway(s) and follow the procedures in the *Back-Office-Bridge Migration Guide*.

- 6 Using X_RISK 7.12.3 or later, replace Manual Fill and Start-of-Day records that do not have account numbers with records that **do** have account numbers. Positions for Manual Fill and Start-of-Day records that do not have account numbers will not be included in account-based risk checking.

Note: All future manual fill and SOD records should be published with account numbers. Not doing this could result in double counting positions (e.g., if a trader has one SOD with an account and another without, the position in his order book will be doubled).

- 7 Enable product and margin limits. Refer to the section called [How and When Do I Enable Account-Based Risk in TT User Setup?](#).

What Other TT Software Should I Upgrade?

Account-based risk configuration requires TT User Setup 7.4.8. After the accounts, account groups, and additional settings are configured, you also need the appropriate versions of TT software to support your desired functionality.

Risk Feature	Required TT Software
Account or account group-based risk checking	TT Gateways 7.16.8 or later. Note: Account-based risk is supported by all TT Gateways 7.16.8 except Eurex Gateway 7.16.8.
Prohibiting users from submitting orders with account numbers that are not defined in TT User Setup	TT Gateways 7.16.8 or later
Prohibiting a user from changing the account number on a fill	X_TRADER 7.12.3 Note: If a user with a pre-7.17 version of X_TRADER changes an account on a fill, the account number on the fill will not be updated in all TT products (including the gateways where account-based risk checking is done). In X_TRADER 7.17 or later, if a user modifies the account on a fill, this update will be processed as a part of account-based risk on the gateways.
Programmatically generating manual fill and Start-of-Day records with account numbers	XTAPI 7.7.9
Limiting the X_RISK Administrator to publishing manual fill or Start-of-Day records to specific accounts	X_RISK 7.12.3

Table 1. Required TT Software

What TT Client Fields Support Account-Based Risk?

TT client products, such as X_TRADER® and X_RISK® will add account and account group support where orders and fills are managed. Users can perform tasks such as grouping positions and P&L by these fields. Additionally, these fields will be standardized by the gateways, so it will always be apparent which field is the risk checked account (i.e., the clearing account). TT client products support account-based risk using the following fields:

Field	Description
Risk Account	The actual clearing account. This value is populated by the gateways with either the Account # , FFT2 , or FFT3 value, depending on which exchange handles the order (for a list of exchanges refer to Table 3, on page 10). This is also the account specified when a manual fill or Start-of-Day is published by account. Note: In the X_RISK Position window, when grouping by account number, the Risk Account field is called Account Number .
Account Group	The group in which the account currently exists; multiple risk accounts can be grouped into a single account group in TT User Setup. Supported clients (e.g., X_TRADER 7.12.3) will automatically be updated if an account is moved into a new account group or from one account group to another.
Account #	Displays the Account # field on an order or fill. It typically represents the clearing account, and will typically contain the same contents of the Risk Account field. The Account # is also mapped to TTORDs.
FFT2	Displays the FFT2 field on an order or fill. This field may, in some cases, represent the clearing account, and therefore, will sometimes contain the same contents of the Risk Account field.
FFT3	Displays the FFT3 field on an order or fill. This field may, in some cases, represent the clearing account, and therefore, will sometimes contain the same contents of the Risk Account field.

Table 2. TT Client Account-Based Risk Fields

Does the Account-Based Risk Checking Add Latency?

If risk checking is turned off at the Member/Group/Trader (MGT) or user level, then applying account-based risk will not add any additional latency to an order. In fact, users should see a performance benefit when using only account-based risk checking. However, if applying client-side checks at the MGT or user level in addition to the account or account group level, then some additional latency will be added to the order.

Are There Changes to the Gateway Startup Process?

A TT gateway will not go active until it finds a TT User Setup server. If the TT User Setup server is 7.4.8 or later, before going active the gateway will download all applicable account-based risk. If an earlier version is detected, the gateway will proceed with the startup process without the account-based risk credentials.

For more information, refer to the appropriate TT Gateway System Administration Manual.

How Are Accounts Risk Checked?

When a client submits an order that includes an account, the TT Gateway checks the order against the limits of the account. If the account belongs to an account group, the TT Gateway risk checks based on the combined positions and working orders of all the accounts in the group. This is independent of the user or MGT risk checking.

If required by the exchange, users enter their clearing account number on orders submitted via X_TRADER or other client trading APIs (e.g., FIX Adapter). In the TT system, the clearing account number is typically entered using the **Account #** field in X_TRADER, but it can be entered using the **FFT2** or **FFT3** fields instead, depending on which exchange handles the order. TT Gateways use this clearing account number to populate the Risk Account field.

For more information refer to the section called [Which Accounts Should I Create?](#)

Can Users Change Accounts on Working Orders?

Some exchanges support changing accounts on working orders. When a user attempts to change the account on a working order, the TT Gateway rechecks the order against the limits of the proposed account or its account group before allowing the change.

For example, if a working order is changed from account "A" to account "B," the gateway applies risk checks to account "B" and rejects the order if it causes account "B" to exceed its position limit. This is similar to how risk limits are enforced on a per order basis (i.e., a change to an order quantity could get rejected if it would exceed a position limit).

What Happens If Risk Is Enabled While There Are Working Orders Without Accounts?

If account-based risk is enabled on the TT Gateway while orders without an account are working, then those working orders are not included in risk calculations. To include these orders in account-based risk, cancel and replace them with orders that contain risk-checked accounts. An alternative, if the exchange supports it, is to add/change accounts on working orders. Changing accounts does not affect their position in the queue.

Note: For exchanges where the account number is not required, risk-checked accounts can still be added.

What happens If an Order is Placed With an Undefined Account?

Accounts that are not defined in TT User Setup are considered undefined. If an undefined account is used, the user settings in TT User Setup determine whether or not the user can submit orders for that account. If a user is not configured to send orders on undefined accounts, then the TT Gateway rejects the order. Delete actions for orders without accounts are supported despite the user level setting so that old GTC orders can be deleted.

If an order with an undefined account is accepted by the gateway, then the gateway still tracks the position. For example, if the account is added later to TT User Setup, then risk checking on the Order Server includes fills generated before the account existed in TT User Setup.

If no clearing account value is entered in X_TRADER, the gateway treats this as an undefined account.

Note: You can prohibit orders that are sent with undefined accounts. Refer to the section called [How Do I Prevent the Use of Undefined Accounts?](#).

What Happens If a User Changes an Account on a Fill?

When the **Account changes on fills allowed** user option is unchecked (the default for new users), users cannot change the account on a fill. When the **Account changes on fills allowed** option is checked (refer to the section called [How Do I Allow Traders to Change Accounts on Fills?](#)), users who are using X_TRADER 7.17 or later can modify the account on a fill, and this update will be processed as a part of account-based risk on the gateways. Note that no risk check actually takes place on the modification; therefore changing the account could cause an account to go over its limits. However, any subsequent orders will be risk checked based on the modified fills.

Note: TT does not recommend checking the **Account changes on fills allowed** option until the users are using X_TRADER 7.17 or later. If users are not using X_TRADER 7.17, then account numbers on fills are not updated in all TT products (this includes the gateways where account-based risk checking is done). This could lead to discrepancies between what is displayed in client applications and how risk is actually being calculated.

What is the impact to SOD records without accounts when auto-calculate-SOD is enabled on TT Gateway 7.16.8?

If you enable `auto-calculate-SOD` after an upgrade or currently have `auto-calculate-SOD` enabled, SOD records created without accounts before the upgrade will not be included in the account-based risk check. The records will still be checked against MGT-based risk settings, and Auto-SOD will continue to re-generate the records every day.

SOD records that occur after upgrading to 7.16.8 that do not contain an account number will not be updated to include fills that contain an account number. New SOD records containing an account number will be generated going forward. Users will see both the old SOD records without an account, as well as the new SOD records with an account. Added together, these SOD records will still give an accurate representation of the user's overall position.

If you want positions represented by SOD records without accounts to be included in account-based risk checks after an upgrade, you must delete these SOD records and manually add them back with risk accounts assigned using X_RISK 7.12.3. After account numbers are added to these SOD records, the positions will be included in the account based SOD records generated by `Auto-Calculate-SOD` at the next session rollover and risk-checked by the TT Gateway.

What Happens When a Gateway Rejects an Order?

If the gateway rejects an order because it would exceed the risk limit on an account, both the audit trail for the user who entered the order, and the log file for the gateway, will include a rejection message. The rejection messages indicate whether an account, user, or MGT limit was breached, as well as which limit was breached.

Creating and Configuring Accounts and Account Groups

Which Accounts Should I Create?

In the TT system, the clearing account number is typically entered using the **Account #** field (e.g., in X_TRADER), but depending on the exchange, TT may require you to enter it into the **FFT2** or **FFT3** fields instead (refer to the table below). To address these exceptions, and to normalize reporting and risk-checking of clearing accounts, the TT Gateway populates the clearing account into a **Risk Account** field. This field will be displayed on orders and fills in TT applications.

The account that will ultimately end up as the **Risk Account** field is the account you create in TT User Setup and configure for risk checking.

For this Exchange...	The Risk Account that Risk Checking is Applied to...
BrokerTec, BVMF, CFE, CME/CBOT, Eurex, MEFF, MX, NYSE Liffe, NYSE Liffe US, OSE, SFE, SGX, TFX, TSE	Account #
ICE	Account # (SMA orders), FFT2 (LMA orders)
TOCOM	FFT3
LME	FFT2

Notes:

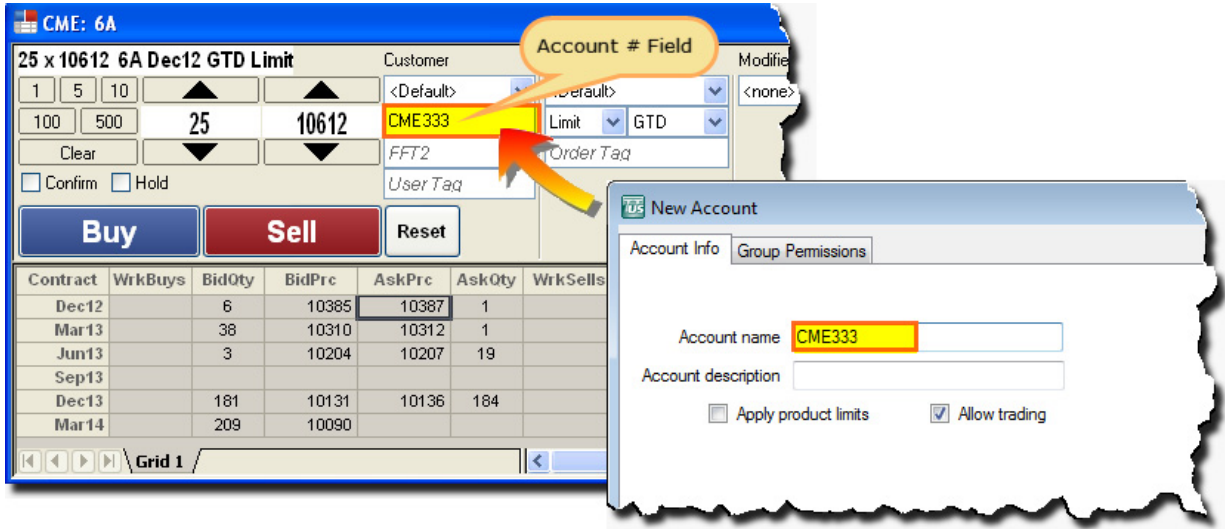
For BVMF, only DMA Traders are required to enter an account number in either the **Account #** (DMA trader ID) or **FFT3** (DMA trader's firm ID) in X_TRADER. Only the **Account #** field will be risk checked.

For exchanges that do not require an account number, an account number can still be used and risk checked. If omitted, however, the trader's order may be rejected if he is not allowed to send orders with undefined accounts (a TT User Setup setting).

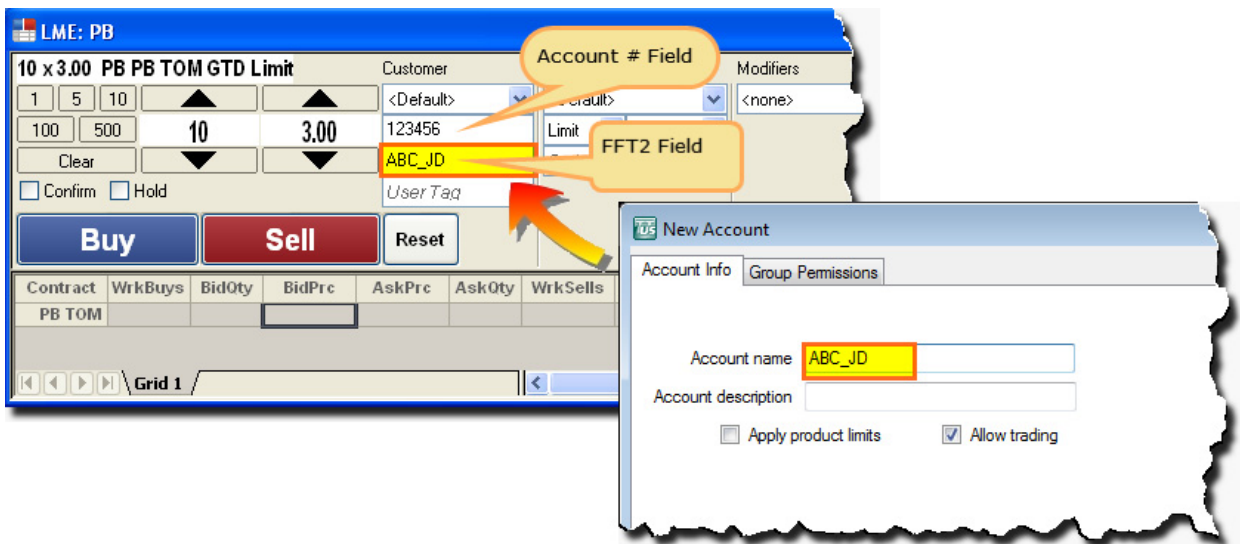
Table 3. Risk Account per Exchange

Note: The **BVMF**, **MEFF**, **SFE**, and **SGX** Gateways support "omnibus account" functionality. The gateway does not risk-check the omnibus accounts entered in **FFT2** or **FFT3**. The gateway will risk check based on the **Account#** field. To risk-check an omnibus account, you must group individual trader accounts into an account group and apply risk checking at the account group level.

Example 1: TT's CME Gateways use the **Account #** field for the clearing account. If a CME trader enters *CME333* in the X_TRADER **Account #** field, the TT User Setup administrator must create and risk manage an account named *CME333*.



Example 2: TT's LME Gateways use the **FFT2** field for the clearing account (the LME Gateway does not forward the contents of the **Account #** field to the exchange). If an LME trader enters *123456* in the X_TRADER **Account #** field, and *ABC_JD* in the **FFT2** field, the TT User Setup administrator must create and risk manage an account named *ABC_JD*.



Note: Accounts that are not clearing accounts may exist in TT User Setup because they have been added manually or added to a user's customer defaults or Gateway Login. Since these accounts won't be risk checked, you should uncheck the **Allow trading** option for these accounts. That way, a user who is not allowed to submit orders with undefined accounts cannot place an order with one of these accounts in his clearing account field. In Example 2, you would uncheck the **Allow trading** option for account 123456.

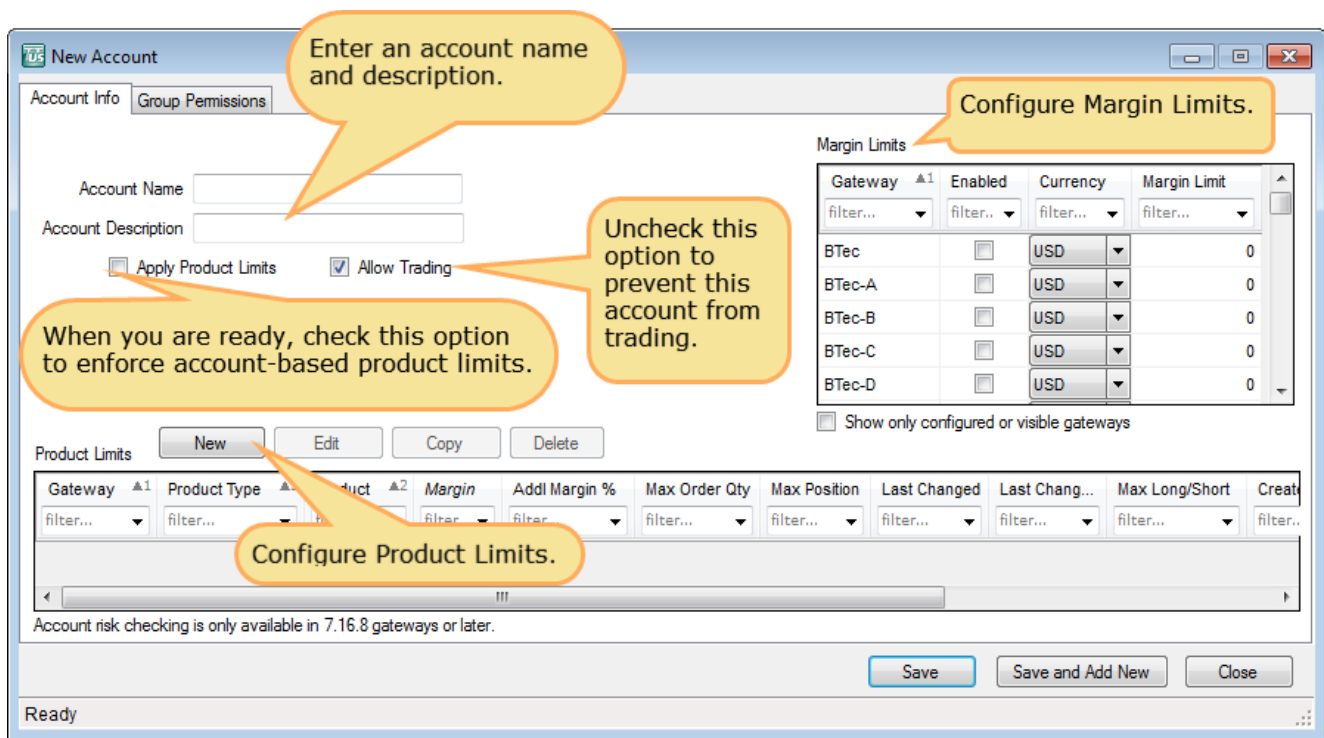
How Do I Create Accounts?

In TT User Setup, risk administrators can predefine accounts. Once defined, administrators can:

- Add accounts to customer defaults (e.g. to predetermine which accounts should be applied to which orders)
- Assign accounts to traders' Gateway Logins
- Add accounts to account groups
- Configure risk limits for accounts/account groups

Note: Account-based risk-checking is independent of any risk checking that may be configured for the user or Member/Group/Trader (MGT).

Note: When accounts are added to an account group, the account's risk settings are deleted and the account group settings are used instead.



How Do I Create Account Groups?

Account groups allow TT User Setup administrators to configure combined risk limits for all of the accounts assigned to an account group. New orders that are submitted with an account in a given account group are checked against the limits of the account group, based on the combined positions and working orders of each account in the group. This is independent of any risk checking that may be configured for the user or Member/Group/Trader (MGT).

Per group, administrators can configure product-specific position and order size limits as well as TT Gateway-specific margin limits. With account group product limits, administrators can also disable trading per product.

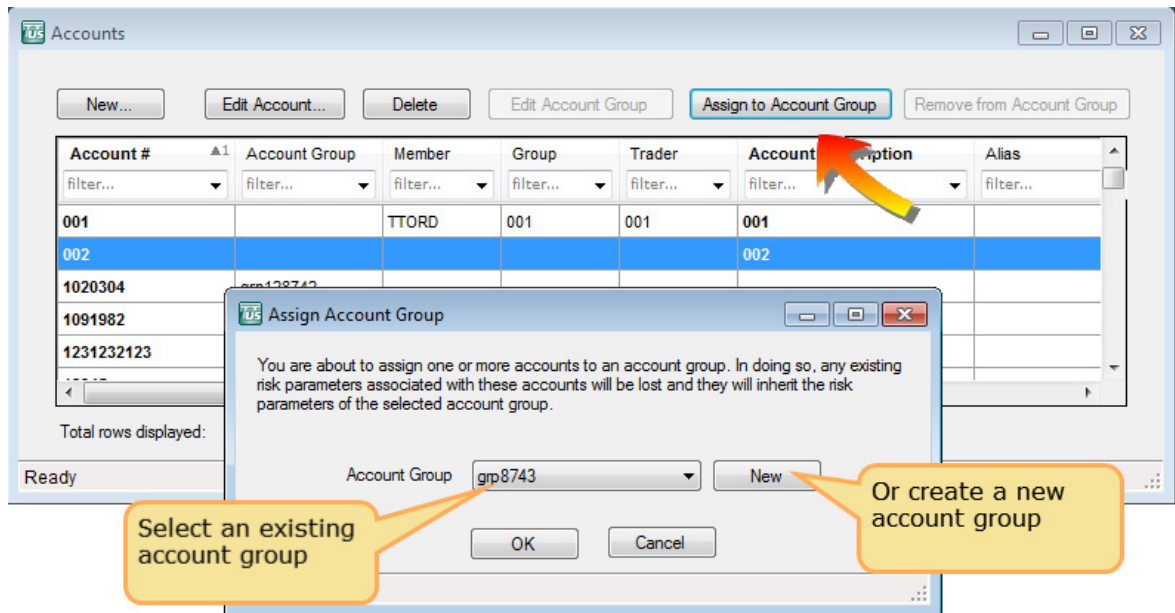
You can create account groups from the **Account Groups** window, or you can create account groups when assigning accounts to account groups. The **New Account Group** window has the same functionality as the **New Account** window.

How Do I Assign an Account to an Account Group?

You can assign one or more accounts to a single account group from the **Accounts** window.

Note: Because users with TTORDs are required to use unique accounts*, you may have several account numbers in TT User Setup that actually each represent a single account. For example, Jon and Sam use account ABC, but because they each have their own TTORD, Jon places orders with account ABC1 and Sam places orders with account ABC2. To apply limits at the account level (i.e., the ABC level), create an account group named ABC, configure the appropriate limits for ABC, and then assign accounts ABC1 and ABC2 to account group ABC. Risk checking will be based on the combined orders and fills of ABC1 and ABC2.

*TT software 7.17 and later will no longer require unique accounts per TTORD.



Configuring Account-Based Limits in TT User Setup

How Do I Configure Product Limits for Accounts and Account Groups?

You can configure product-specific position limits and product-specific order size limits, per account or account group. The user and gateway login's risk settings still apply, but orders submitted with an account will also be checked against the limits of the account (or if the account is in an account group, against the combined positions and working orders of all accounts in the group).

Configuring product limits per account group also allows you to perform the following tasks, which are not available for Gateway Logins:

- Disable trading per product (to easily prevent trading on one or more specific products without having to specifically define each individual product that is allowed to be traded).
- Configure a maximum position limit of zero.
- Configure how far away from the market an order can be placed per product.

Note: To enable account/account group-based product limits, refer to the section called [How and When Do I Enable Account-Based Risk in TT User Setup?](#)

The screenshot shows the 'New Product Limit' dialog box with several callout annotations:

- Account:** Ex234
- Gateway:** Eurex
- Product type:** FUTURE
- Product:** (empty field)
- Margin:** (empty field)
- Additional margin (+/-%):** 0
- Maximum order qty:** 1000
- Maximum position:** Unlimited
- Maximum long/short:** Unlimited
- Allow trading:** (checked)
- Prevent orders that are more than:** (empty field) ticks from the market price
- Only enforce a maximum price on buy orders and a minimum price on sell orders:** (checked)
- Show all gateways:** (checked)

Callout annotations:

- Select a Gateway, product type, and product to which the limits apply.
- Specify the % above or below the current margin that an account must have to trade the contract.
- If the maximum order quantity, position, or long short should be limited, check the option and set the limit.
- Uncheck this option to prevent this product from being traded.
- Use **Save and Add New** to create another similar limit.
- Check this option to show all gateways in the Gateways drop-down.
- Check the **prevent orders...** option to configure how far from the market users may enter a price for this product when using the specified account.

Defining Maximum Position

The following describes the differences in maximum position depending on whether maximum position is related to a Future, Option, Spread, or Strategy.

- **Future:** Limits the maximum outright futures position to the value in the **Maximum Position** field. In other words, it limits the maximum position (long or short) that a trader may accumulate at the product level (the sum total of all delivery months). Traders that only trade calendar spreads, for example, will never reach this limit because their positions in one contract offset the positions in another contract.

- **Spread:** A spread can be either an Intra-Product spread (e.g., all legs belong to the same product) or an Inter-Product spread (e.g., legs will belong to multiple products).
 - **Intra-Product Spread:** Limits the maximum contract-level position for each delivery month to the value in the **Maximum Position** field. The **Maximum Position** field does not put a hard limit on the number of spreads that a trader may enter; it only limits the position for each contract of a product.

For example, if the limit is 5, an account can buy 5 calendar spreads, because each contract in the spread is limited to a long or short position of 5. This check would also apply to the futures contract being traded directly, so in the previous example, no more futures could be bought in the contract that is long 5 and no more could be sold in the contract that is short 5.
 - **Inter-Product Spread:** Does not use the **Maximum Position** field for risk checking. To manage position risk on Inter-Product Spreads, you must enter both FUTURE and SPREAD type position limits for each of the products that comprise that Inter-Product Spread.
- **Option:** Limits the maximum option position to the value in the **Maximum Position** field. In other words, limits the maximum position (long or short) that a trader may accumulate at the product-level (the sum total of all delivery months at all exercise prices). For the purposes of risk checking, calls and puts are treated as separate products. For example, buying a call and selling a put will not result in a flat position, but instead will result in two separate positions that do not offset each other.
- **Strategy:** Limits the maximum contract-level position for each call or put of a specific strike price and delivery month to the value in the **Maximum Position** field. The **Maximum Position** field does not put a hard limit on the number of strategies that a trader may enter; it only limits the position for each contract of a product.

Note: To allow trading of spreads or strategies, you must also configure product limits for the products that comprise the spreads or strategies.

Note: The rules for configuring all other product types are identical to the rules for configuring futures and spreads, except that limits for energy products are configured in lots. For example, for an energy contract consisting of 31 lots, to restrict the contract position to one, you would enter 31 into the **Maximum Position** field.

Defining Maximum Long/Short

While the **Maximum Position Limit** field limits position per overall product and/or contract (depending on the product type for which it's configured), the **Maximum Long/Short** limit is an aggregate limit – it is used primarily to limit how many spreads a trader can put on when there are multiple contract months. The sum of the long positions in all contracts cannot exceed this limit; nor can the sum of the short positions. For example, if the limit is two, and there is a long position of one in one contract and a working buy of one a different contract, then no more buy orders can be placed.

The **Maximum Long/Short** limit cannot be configured for product limits where product is "Spread" or "Strategy." This is because the limit only has to be defined once per product; it will still apply to all trades for that product. For example, if you define a Maximum Long/Short limit for the ES Future, that limit is still taken into consideration when trading an ES Spread.

Defining Maximum Order Size

The **Maximum Order Size** limits the size of a single order entering the market. For order types such as icebergs that release a disclosed order quantity that is less than the total order quantity at various intervals, the **Maximum Order Size** only restricts the size of the disclosed order quantity. For example, if **Maximum Order Size** is limited to 10, then an iceberg could not send individual orders with a size greater than 10, but the total order size of the iceberg could be greater than 10.

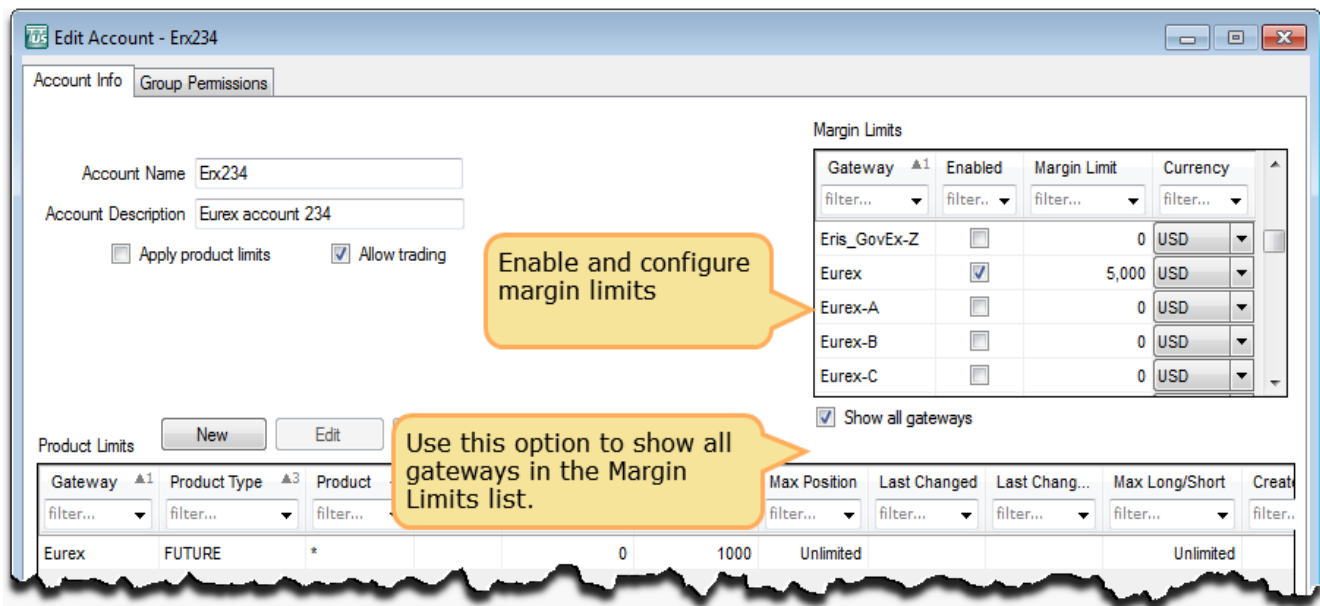
When increasing an order size by changing (or canceling and replacing) the order, the new order quantity can only exceed the current working order quantity by the **Maximum Order Size** limit. For example, assume the **Maximum Order Size** limit is 5. If a 5-lot buy order is working and then gets a partial fill of quantity 2, the new working quantity would be 3. Because you can only increase the current working order quantity by 5, the new order quantity is limited to 8 (3+5) or less.

How Do I Configure Margin Limits for Accounts and Account Groups?

Margin limits allow you to limit the product margin that can be accumulated per account or account group on a specific TT Gateway. This is similar to the current credit limit at the user or Gateway Login level, except that because P&L spans across exchanges, account-based margin limits ignore P&L. Additionally, margin limits apply, even if product limits are not applied. This allows you to create margin limits without creating product limits.

Example:

Account ABC has a \$7,000 margin limit. If the margin for 1 ES contract is \$3500, and Trader_1 buys 1 ES contract in account ABC, the available credit in account ABC would be \$3500. If Trader_2 then buys 1 ES contract in the same account, the available credit in account ABC would be \$0. No additional ES contracts can be bought in account ABC, and up to four can be sold.



Note: You can configure specific product margins for products from TT User Setup's **Product Margins** window.

How and When Do I Enable Account-Based Risk in TT User Setup?

When you are ready to go live with account-based risk, configure account-based margin limits as needed and then check the account or account group's **Apply product limits** option.

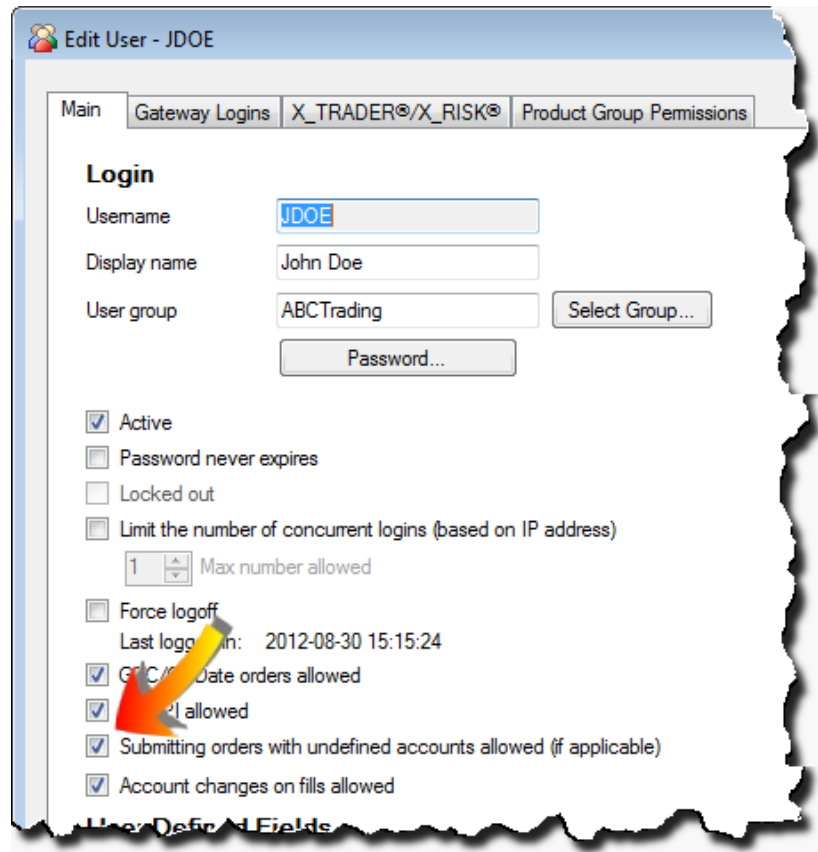
When you enable account-based risk while there are GTC orders or other working orders without an account, then those working orders are not included in risk calculations. To include these orders in account-based risk, cancel and replace them with orders that contain risk-checked accounts. An alternative, if the exchange supports it, is to add/change accounts on working orders. Changing accounts does not affect their position in the queue.

Managing Account-Based Risk-Related User Settings in TT User Setup

How Do I Prevent the Use of Undefined Accounts?

Accounts that are not defined in TT User Setup are considered undefined. If no account value is entered, the gateway treats this as an undefined account.

Configure whether or not the gateways should immediately reject orders submitted with an account that is not defined in TT User Setup, or whether the gateways will allow undefined accounts as long as it is permitted by the customer default settings. Check the **Submitting orders with undefined accounts allowed** option to allow undefined accounts, or uncheck the option to prohibit undefined accounts.

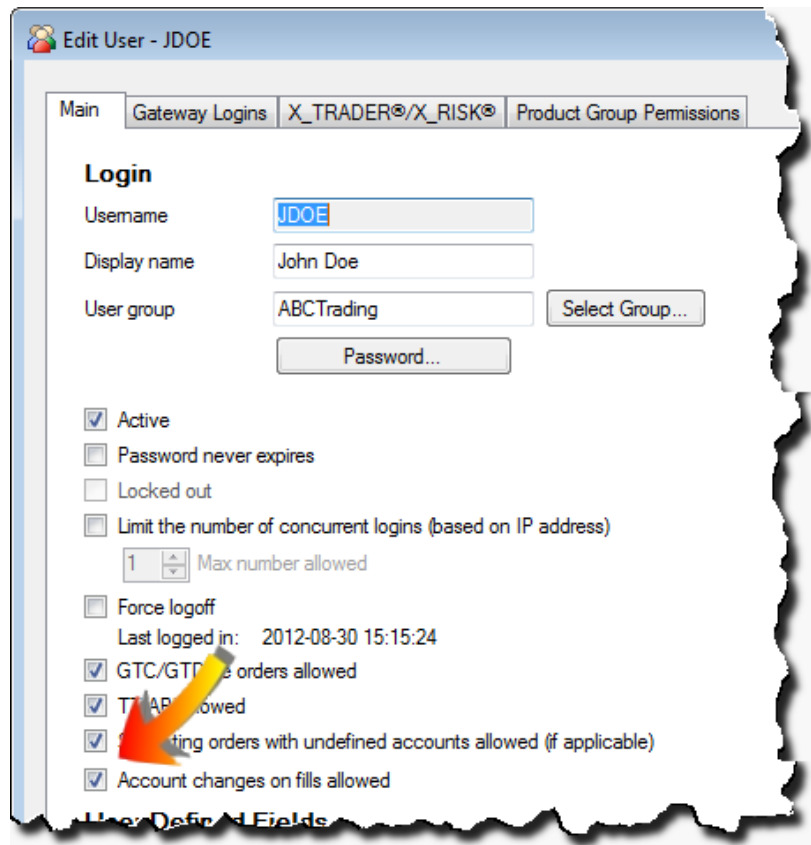


How Do I Allow Traders to Change Accounts on Fills?

To prevent a user from updating the account number on a fill, make sure the **Account changes on fills allowed** option is unchecked (the default setting for new users).

When applying account-based risk checking, TT does not recommend checking the **Account changes on fills allowed** option until the users are using X_TRADER 7.17 or later. If users are not using X_TRADER 7.17, then account numbers on fills are not updated in all TT products (this includes the gateways where account-based risk checking is done). This could lead to discrepancies between what is displayed in client applications and how risk is actually being calculated.

When the **Account changes on fills allowed** option is checked, users who are using X_TRADER 7.17 or later can modify the account on a fill, and this update will be processed as a part of account-based risk on the gateways. Note that no risk check actually takes place on the modification; therefore changing the account could cause an account to go over its limits. However, any subsequent orders will be risk checked based on the modified fills.



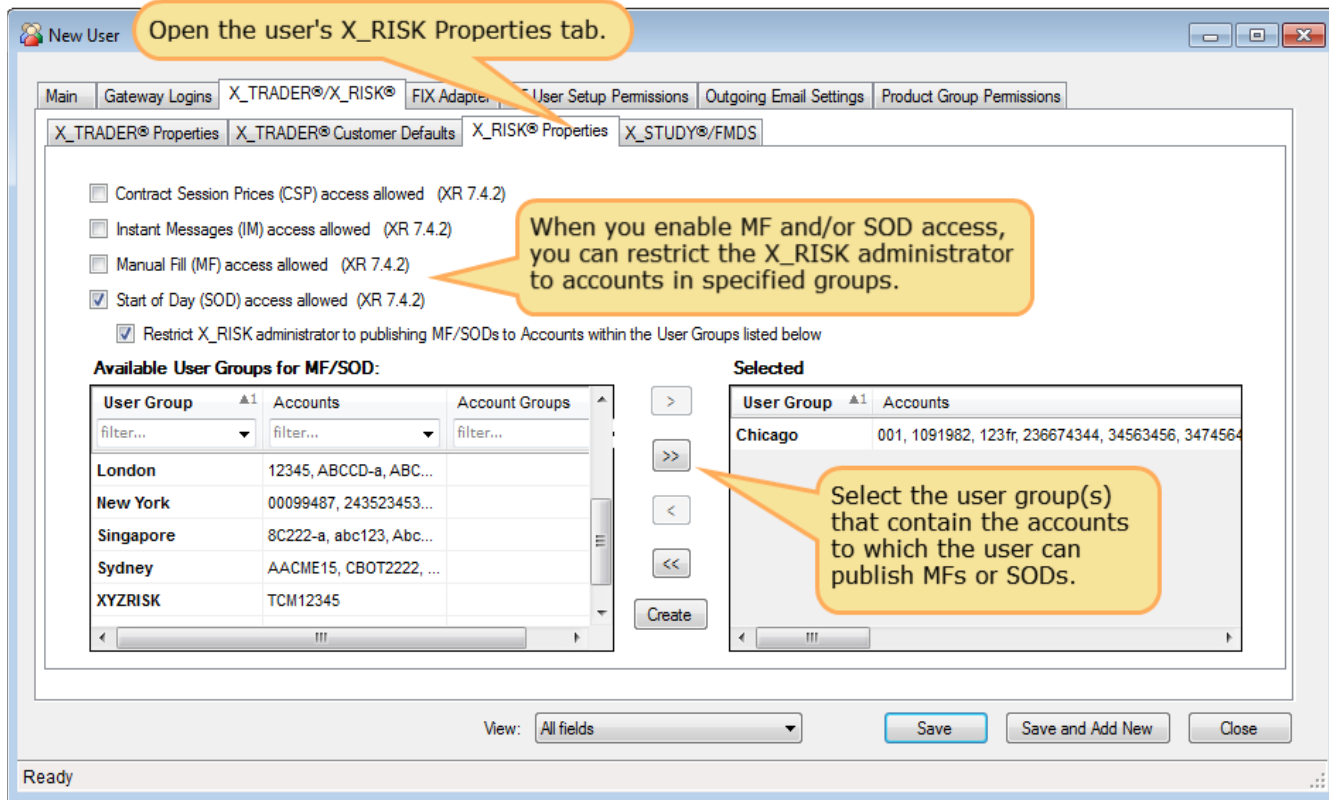
Configuring Manual Fill and Start-of-Day Records by Account

Does X_RISK Support Accounts and Account Groups? Yes, X_RISK 7.12.3 allows administrators to group positions and P&L by account or account group.

Do X_RISK and the XTAPI Support Start-of-Day and Manual Fill Records by Account? Yes, X_RISK 7.12.3 and XTAPI 7.7.9 allow administrators to publish Start-of-Day and manual fill records by account. TT recommends that all Start-of-Day records submitted to gateways that support account-based risk (and have `Auto-Calculate-SOD` enabled) have a valid account number. If the gateway supports account based risk, attempts to publish a Start-of-Day record without an account number could result in double counting of positions (e.g., if a trader has one SOD record with an account and another without, the position in his order book will be doubled).

How Are Account-Based Start-of-Day Records Displayed in TT Clients? New clients can display account-based Start-of-Day records, meaning more than one Start-of-Day record will be possible per MGT and contract. Updating and/or dropping Start-of-Day records works the same way as in previous versions.

How Do I Limit X_RISK Administrators to Publishing Manual Fills and Start-of-Day Records for Specific Accounts? TT User Setup allows you to limit X_RISK administrators to publishing Start-of-Day records and/or Manual Fills for specific accounts.



Note: By default, accounts are automatically added to user groups as they are associated with users directly or to users' gateway logins. However, accounts can be manually added to user groups as well.

Create or edit an account and select the Group Permissions for Account tab.

Select user groups from the Available User Groups and move them to the Account permitted in the following User Groups list.

User Group	Users with Account
Chicago	ZJDOEOVER
London	
New York	