Financial Calculations & Definitions

Spread

1. Definition

Spread is the difference between the Ask price (Buy price) and the Bid price (Sell price) of an instrument at a specific moment.

Spread represents the immediate transaction cost paid by the client when opening a position.

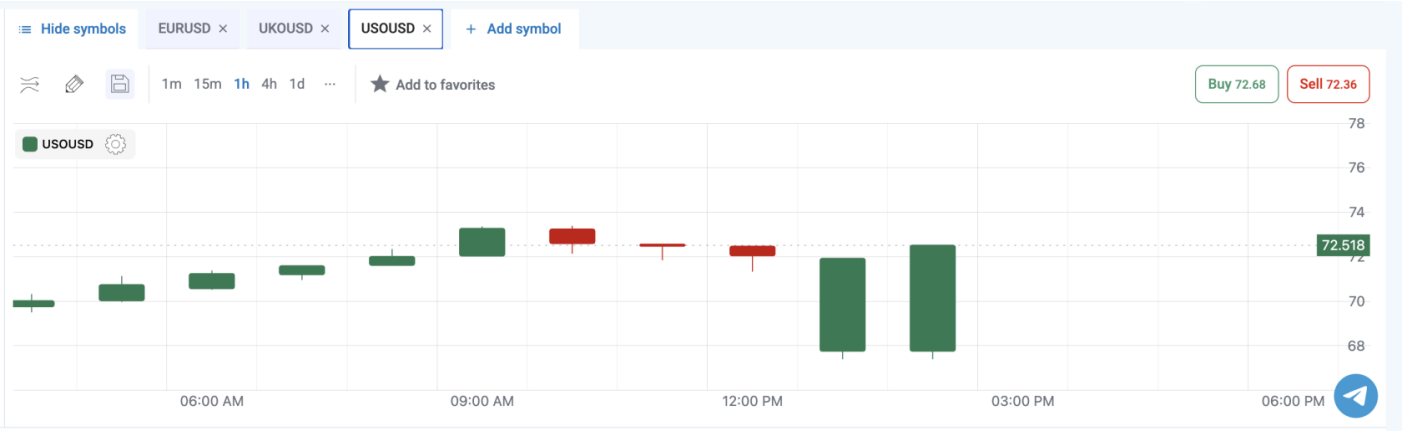
2. Formula


```
Spread = Ask - Bid
```

Where:

- **Ask** — price displayed in the Buy button
- **Bid** — price displayed in the Sell button

3. Example



Spread is measured in the **instrument price unit**.

For instruments quoted against USD (e.g. USOUSD, WTI, BRENT, BTCUSD):

```
Unit = USD
```

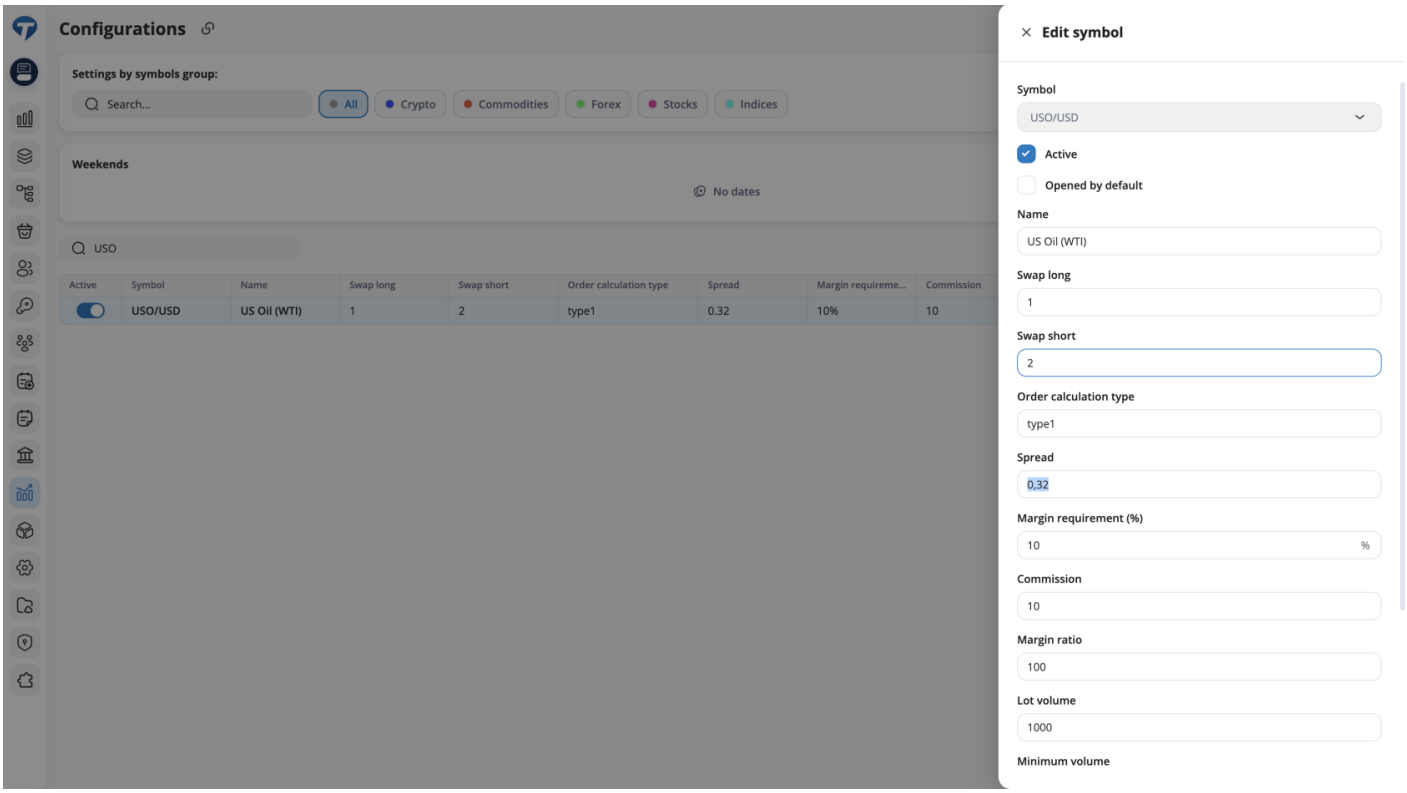
Example:

```
Ask = 72.68
Bid = 72.36

Spread = 72.68 - 72.36 = 0.32
```

Result: **0.32 USD**

4. Configuration



Spread is configurable per symbol in CRM.

Location:

(CRM_URL)/ms/trading/configuration

Configuration is done **separately for each symbol**.

Field:

Spread

Example (from USO/USD configuration):

- Spread = 0.32

Static used margin

Overview

Static Used Margin is an optional **fixed margin amount** that can be applied to a trading position **in addition to the standard margin**.

This value is stored **per order** and **per position** and is included in the **account's total used margin calculation**.

If not specified, **static used margin defaults to** `0`.

Business Purpose

Static used margin exists to support cases where **standard leverage-based margin alone is insufficient**.

Purpose	Description
Regulatory requirements	Some jurisdictions require an additional fixed margin per position regardless of leverage.
External risk rules	Liquidity providers or internal risk engines may require an additional fixed margin component.
Product-specific margin models	Certain trading products may require a minimum margin per position.
Operational risk control	Allows manual or automated systems to increase margin requirements for specific trades.

Impact on Client Accounts

When static used margin is applied:

- **Used margin increases**

- **Free margin decreases**
- **Margin level decreases**
- **Margin call / liquidation may trigger earlier**

This provides **additional risk protection** for the platform.

Margin Calculation

Position Used Margin Formula

```
Used Margin = Leverage Margin + Static Used Margin
```

Where:

Leverage Margin

```
Leverage Margin = Position Value ÷ Leverage
```

Example:

Parameter	Value
Position Value	€10,000
Leverage	1:10
Leverage Margin	€1,000
Static Used Margin	€200

Result:

```
Used Margin = 1000 + 200 = €1,200
```

Defaults

Field	Default
static_used_margin	0

If not set:

```
Used Margin = Leverage Margin
```

Example Scenario

A broker introduces **minimum margin per trade = €500**.

Trade parameters:

Parameter	Value
Position Value	€4,000
Leverage	1:20

Leverage Margin:

```
4000 / 20 = €200
```

Minimum margin required = €500

Static margin applied:

```
static_used_margin = 300
```

Final used margin:

```
200 + 300 = €500
```

Summary

Attribute	Description
Type	Fixed additional margin
Level	Per position
Default	0
Purpose	Regulatory / risk / product margin rules

Attribute	Description
Effect	Increases used margin and reduces free margin

Take profit / Stop loss - Distances and Validation

Overview

Take Profit (**TP**) and Stop Loss (**SL**) can be set when:

- opening a **new order**
- **modifying** an existing order

When TP or SL is enabled, the platform:

1. **Automatically fills default values**
2. **Validates minimum distance** from the reference price
3. **Clears the value** if the option is disabled

The rules depend on the **symbol group**.

Symbol group	Distance type
Crypto	Percentage
Other instruments (Forex, indices, commodities, etc.)	Pips / points

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Symbol Groups

The system determines the rule set based on the **symbol group**.

Group	Behavior
Crypto	Percentage-based TP/SL
Other groups	Pip / point-based TP/SL

Default TP / SL Values

When a user enables **Take Profit** or **Stop Loss**, the system automatically inserts a default value.

Asset class	Side	Default Take Profit	Default Stop Loss
Crypto	BUY	Ask + 1%	Ask − 1%
Crypto	SELL	Bid − 1%	Bid + 1%
Other instruments	BUY	Ask + 100 pips	Ask − 100 pips
Other instruments	SELL	Bid − 100 pips	Bid + 100 pips

Important

- Defaults are intentionally **larger than the minimum allowed distance**.
- This ensures automatically generated TP/SL values are **always valid**.

Minimum Distance

TP and SL must be placed at least a **minimum distance** away from the reference price.

Asset class	Minimum distance
Crypto	**0.1%** of reference price
Other instruments	**1 pip**

The system prevents users from placing TP or SL inside this restricted zone.

Validation Rules

BUY Orders

Rule

Take Profit must be **above** the reference price
Stop Loss must be **below** the reference price

Additionally:

- TP must be at least **minimum distance above**
- SL must be at least **minimum distance below**

SELL Orders

Rule
Take Profit must be **below** the reference price
Stop Loss must be **above** the reference price

Additionally:

- TP must be at least **minimum distance below**
- SL must be at least **minimum distance above**

Reference Price

The **reference price** used for TP/SL calculation depends on context.

Context	Order type	Reference price
New order	MARKET	Current **Ask** for BUY, **Bid** for SELL
New order	LIMIT	Limit price entered in the form
Modify order	MARKET	Order execution price
Modify order	LIMIT	Updated limit price (if edited), otherwise existing order price

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Example Calculations

Crypto Example

Reference price:

BTC = 50,000

Value	Result
Default TP	50,500
Default SL	49,500
Minimum distance	50

EUR/USD Example

Reference price:

Ask = 1.0850

Value	Result
Default TP	1.0950
Default SL	1.0750
Minimum distance	0.0001

USD/JPY Example

Reference price:

Ask = 150.25

Value	Result
Default TP	151.25
Default SL	149.25
Minimum distance	0.01

Where These Rules Apply

Order Form (New Orders)

When creating a new order:

- Default TP/SL values are inserted when enabled
- Validation ensures minimum distance rules are respected
- TP/SL values are cleared when disabled

Modify Order

When editing an existing order:

- Default TP/SL values follow the same rules
- Reference price is based on the order price
- Validation rules remain identical

Key Principles

The system follows three main principles:

1. **Automatic defaults**
   When TP/SL is enabled, reasonable default levels are provided.
2. **Minimum distance protection**
   TP/SL cannot be placed too close to the reference price.
3. **Consistency across workflows**
   The same rules apply when creating and modifying orders.

Summary

Feature	Crypto	Other Instruments
Default TP	±1%	±100 pips
Default SL	∓1%	∓100 pips
Minimum distance	0.1%	1 pip
Reference price	Ask / Bid	Ask / Bid

Defaults are intentionally **larger than the minimum allowed distance**, ensuring automatically generated TP/SL values always pass validation.

Trading Account Metrics

This section describes the financial and margin properties displayed in the **trading account panel** . These metrics represent the current state of a trader’s account, including capital, open position performance, and margin usage.

Displayed properties:

Balance

On Hold (displayed if exists)

Equity

Profit

Used Margin (displayed if exists)

Free Margin

Margin Level (displayed if Used Margin exists)

Leverage

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1. Balance

Description

Balance represents the **total funds in the trading account after all closed operations**.

Balance reflects **realized results only** and does **not include floating profit or loss from open positions**.

Opening a position does **not change Balance**.

Balance Changes When

- deposit is completed
- withdrawal is completed
- trade is closed
- swap is charged
- commission is charged
- manual adjustment is made

Formula

```
Balance =
Deposits
+ Closed Profits
- Closed Losses
- Completed Withdrawals
- Commissions
- Swaps
+ Adjustments
```

Simplified:

```
Balance = Previous Balance + Realized PnL
```

---

2. On Hold

Description

On Hold represents **funds temporarily reserved for pending financial operations**, such as withdrawal requests.

These funds are excluded from the amount available for trading until the operation is completed or cancelled.

Display Rule

```
Displayed only if On Hold > 0
```

Example

```
Balance = 10 000
On Hold = 3 000
```

Funds available for trading:

```
Available Balance = 7 000
```

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3. Equity

Description

Equity represents the **current real-time value of the account**, including floating profit or loss from open positions.

Equity changes continuously as market prices move.

It is the **primary value used for margin risk calculations**.

Formula

```
Equity = (Balance − On Hold) + Profit
```

Where:

```
Profit = Floating PnL from open positions
```

---

4. Profit

Description

Profit represents the **unrealized profit or loss from open positions**.

It updates continuously based on market price changes.

Positive values represent **profit**, negative values represent **loss**.

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5. Used Margin

Description

Used Margin represents the **total collateral required to maintain all open positions**.

Margin is not a cost and does not reduce the account balance. It represents funds temporarily reserved by the trading engine to support open positions.

Display Rule

```
Displayed only if Used Margin > 0
```

Total Used Margin

```
Used Margin = sum(margin of all open positions)
```

---

6. Free Margin

Description

Free Margin represents the **amount of funds available to open new positions**.

Free Margin decreases when:

- new positions are opened

Formula

```
Free Margin = Equity − Used Margin
```

---

7. Margin Level

Description

Margin Level represents the **ratio between equity and used margin**, expressed as a percentage.

It is the **primary indicator of account risk** and determines when margin call or stop-out conditions occur.

Display Rule

```
Displayed only if Used Margin > 0
```

Formula

```
Margin Level (%) = (Equity / Used Margin) × 100
```

---

8. Leverage

Description

Leverage defines the **maximum trading exposure relative to the trader’s capital**.

Higher leverage reduces the margin required to open positions.

Example

```
Leverage = 1:100
```

Meaning the trader can control:

```
100 units of market exposure for every 1 unit of capital
```

Account Calculation Relationships

The core account metrics are calculated using the following relationships:

$$\text{Profit} = \text{Floating PnL}$$

$$\text{Equity} = (\text{Balance} - \text{On Hold}) + \text{Profit}$$

$$\text{Used Margin} = \text{sum(position margins)}$$

$$\text{Free Margin} = \text{Equity} - \text{Used Margin}$$

$$\text{Margin Level (\%)} = (\text{Equity} / \text{Used Margin}) \times 100$$

Price Delta

Overview

Price Delta is a mechanism to simulate controlled price movement for a symbol over a defined time interval.

The system:

- Applies a **fixed price shift (in pips)** during a selected period
- Smoothly transitions into and out of this shift
- Prevents unrealistic instant price jumps

This feature is primarily used for:

- testing trading scenarios
- simulating volatility
- validating risk, margin, and liquidation logic

Core Concepts

1. Time Range (From / To)

Defines the **main active interval** where the full price change is applied.

- **From** — start time of full delta
- **To** — end time of full delta

During this interval:

> Price is shifted by the full configured delta

---

2. Price Delta (Pips)

Defines the magnitude of the price change.

- Positive → price increases
- Negative → price decreases

Formula:

```
Adjusted Price = Base Price ± Delta
```

---

3. Smooth Change Steps

Defines how many incremental steps are used to **gradually apply and remove** the delta.

- Steps are applied:
  - before the main interval
  - after the main interval
- Prevents sharp jumps in the chart

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4. Step Duration

Defines how long each smoothing step lasts.

- Unit: minutes
- Total smoothing duration =

  ```
  steps × step_duration
  ```

Full Behavior Model

The system consists of **3 phases**:

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1. Pre-Smoothing Phase

- Starts before `From`
- Price gradually moves from:

  ```
  0 → full delta
  ```

---

2. Active Phase

- Between `From` and `To`
- Price remains at:

  ```
  full delta
  ```

---

3. Post-Smoothing Phase

- Starts after `To`
- Price gradually returns:

  ```
  full delta → 0
  ```

Example — Correct Timeline

Configuration

Parameter	Value
Symbol	EUR/USD
From	10:00
To	11:00
Delta	+100 pips
Smooth Steps	10
Step Duration	10 minutes

Calculations

- Smoothing duration:

  ```
  10 × 10 min = 100 minutes
  ```

Timeline

```
08:20 → smoothing starts
10:00 → full +100 pips reached
10:00–11:00 → constant +100 pips
11:00 → smoothing down starts
12:40 → price returns to normal
```

Step Behavior

Pre-smoothing

```
08:20 → +10 pips
08:30 → +20 pips
...
09:50 → +100 pips
10:00 → full delta active
```

Active Phase

```
10:00 → 11:00
```

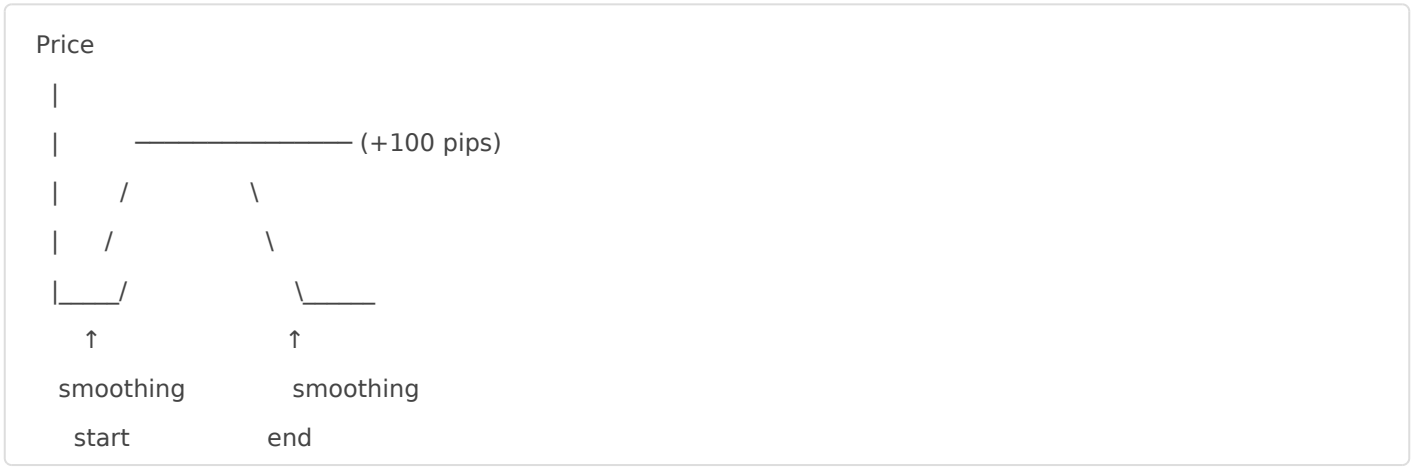
Price = **+100 pips**

Post-smoothing

```
11:00 → +90 pips
11:10 → +80 pips
```

```
...
12:40 → 0 pips
```

Visual Model



Important Rules

1. Delta is Absolute

- Applied relative to current/base price
- Not cumulative over time

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2. Smoothing Applies on Both Sides

- `N` steps before `From`
- `N` steps after `To`

---

3. No Instant Application

The system does NOT support:

- immediate price override

- single candle injection

All changes must follow:

> defined timeline + smoothing

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4. Time Validity

- Time must be within:

  ```
  00:00 – 23:59
  ```

- If smoothing goes before `00:00`:
  → it moves to the **previous day**

Edge Cases

1. Smoothing in the Past

If:

- smoothing start time is already in the past

Then:

- steps may be skipped or not applied correctly

---

2. Zero Steps

If:

```
Smooth Steps = 0
```

Then:

- instant jump at `From`

- instant revert at `To`

---

3. Negative Delta

Works identically:

```
Delta = -50 pips
```

Result:

- price decreases smoothly
- holds lower level
- returns gradually