

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
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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:

$$\text{Adjusted Price} = \text{Base Price} \pm \text{Delta}$$

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

4. Step Duration

Defines how long each smoothing step lasts.

- Unit: minutes
- Total smoothing duration =

$$\text{steps} \times \text{step_duration}$$

Full Behavior Model

The system consists of **3 phases**:

1. Pre-Smoothing Phase

- Starts before
- Price gradually moves from:

0 → full delta

2. Active Phase

- Between and
- Price remains at:

full delta

3. Post-Smoothing Phase

- Starts after
- 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:

$10 \times 10 \text{ min} = 100 \text{ minutes}$

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

- single candle injection

All changes must follow:

// defined timeline + smoothing

4. Time Validity

- Time must be within:

00:00 - 23:59

- If smoothing goes before :
→ 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

- instant revert at
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3. Negative Delta

Works identically:

Delta = -50 pips

Result:

- price decreases smoothly
 - holds lower level
 - returns gradually
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