

Normalized Displacement Pullback

Expert Advisor Documentation

PLATFORM

MetaTrader 5 (MT5)

TYPE

Trend Continuation (Pullback)

TIMEFRAME

M15 – H1

WEBSITE

www.algobot.live

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Overview

Normalized Displacement Pullback (NDP) is a trend-continuation Expert Advisor built around a single, volatility-normalized displacement oscillator. Rather than measuring how far price has moved in raw points, it measures how far price has stretched away from its own mean in *units of ATR* — the classic "Pretty Good Oscillator" construction:

$$\text{DISP} = (\text{Close} - \text{SMA}(\text{Close}, \text{MaPeriod})) / \text{ATR}(\text{AtrPeriod})$$

A raw close-minus-mean gap tells you nothing on its own: 30 points is enormous on a quiet day and trivial on a wild one. Dividing by ATR converts that gap into a pure "how many average bars of travel am I away from fair value" number that is directly comparable across symbols, sessions and volatility regimes.

Empirically `|DISP|` rarely exceeds about 3, so a reading beyond the `ThrustThreshold` signals that price has genuinely *displaced* — a real one-sided impulse rather than chop.

Crucially, NDP does **not** chase that thrust. Buying a 3-ATR extension is poor reward-to-risk and frequently marks the exhaustion top. Instead the thrust merely *arms* a direction; the EA then waits for the natural retrace back toward the mean and enters as the oscillator turns and resumes in-trend — the high-probability "reload" inside an established impulse.

The core idea: A strong displacement proves a trend exists; the shallow pullback offers a favourable entry price; the oscillator turning back in-trend confirms the pullback is resolving. NDP combines all three so it buys strength on a discount rather than paying up for an extended move.

How It Works

The EA processes one primary-timeframe bar at a time. On each newly-closed bar it appends the bar to lock-step rolling buffers (high, low, close) and computes that bar's normalized displacement `DISP`. It then evaluates open-position management first, and only if flat does it look for a fresh entry.

The Displacement Oscillator

For every closed bar the EA computes the simple moving average of close over `MaPeriod`, the ATR over `AtrPeriod`, and forms:

$$\text{DISP} = (\text{Close} - \text{SMA}) / \text{ATR} \quad (\emptyset \text{ when ATR is not yet valid})$$

- **DISP > 0** — price is above its mean (bullish stretch).
- **DISP < 0** — price is below its mean (bearish stretch).
- **|DISP| ≥ ThrustThreshold** — a genuine directional impulse worth trading behind.

Entry Logic — Long

A long "reload" arms when all of the following are simultaneously true on the just-closed bar:

- **Up-thrust in window:** within the last `LookbackThrust` bars, `DISP` reached at least `+ThrustThreshold` (a confirmed bullish impulse).
- **Shallow in-trend pullback:** `DISP` has since retraced into the band `0 < DISP ≤ PullbackLevel` — price pulled back toward the mean but is still above it, so the trend remains intact.
- **Oscillator resuming up:** `DISP` has just ticked back up (`disp0 > disp1`) — the pullback is resolving in-trend.
- **Momentum agrees:** `RSI(RsiPeriod) ≥ 50`.

When armed, the EA buys at the ask.

Entry Logic — Short

The short setup is the exact mirror image:

- **Down-thrust in window:** `DISP` reached at least `-ThrustThreshold` within the last `LookbackThrust` bars.
- **Shallow in-trend pullback:** `DISP` now inside `-PullbackLevel ≤ DISP < 0`.

- **Oscillator resuming down:** `disp0 < disp1`.
- **Momentum agrees:** `RSI ≤ 50`.

When armed, the EA sells at the bid.

Stop Loss & Take Profit

Risk is sized purely from volatility. On entry the EA places a fixed ATR-based bracket:

```
Stop Loss    = entry ∓ AtrStopMult × ATR
Risk         = | entry - StopLoss |
Take Profit  = entry ± RewardRisk × Risk
```

With the defaults (`AtrStopMult = 1.6` , `RewardRisk = 2.0`) the stop sits 1.6 ATR from entry and the target is twice that distance — a 2:1 reward-to-risk bracket that manages every exit once the position is open.

Exit Logic

- **Bracket exit:** in normal operation the position is closed by its stop loss or take profit — the ATR bracket handles the trade end to end.
- **Protective flip-exit:** the EA closes early if `DISP` violently crosses to the far side against the position — a long closes when `DISP ≤ -ExitFlipLevel` , a short closes when `DISP ≥ +ExitFlipLevel` . The impulse that justified the trade has decisively reversed, so the EA does not wait for the full stop.

Position & Trade Filters

- **One position per magic:** only a single position (identified by `Magic`) is held at a time — no new entry is taken while in-trade.
- **Spread filter:** new entries are skipped whenever the current spread exceeds `MaxSpreadPoints` , avoiding costly fills.
- **Warm-up guard:** the EA waits until it has enough valid history that every bar in the thrust window has a real displacement reading before it trades.

Worked example (long)

On EURUSD H1, ATR is 0.0011 and the SMA(20) reads 1.08500. Over the last few bars `DISP` pushed to `+2.7` (a genuine up-thrust, above the 2.5 threshold). Price then eased back so `DISP` now reads `+0.6` — still above the mean but retraced into the shallow band — and this bar's `DISP` (0.6) is higher than the prior bar's (0.4), while RSI holds at 56. NDP buys at the ask 1.08640. Stop = $1.08640 - 1.6 \times 0.0011 = 1.08464$; risk = 0.00176; target = $1.08640 + 2.0 \times 0.00176 = 1.08992$.

Strategy in Action

The illustration below shows an example of how the strategy identifies a setup and triggers its entry and exit. This is a simplified, illustrative example for educational purposes — not real market data.



Illustrative example only. Actual market behaviour varies.

Parameters

Parameter	Default	Description
MaPeriod	20	SMA period of close the displacement is measured from. Range 8–60, step 1.
AtrPeriod	14	ATR lookback used both to normalize the displacement and to size the stop. Range 5–40, step 1.
ThrustThreshold	2.5	How far <code> DISP </code> (in ATR units) must reach to count as a real directional thrust. Range 1.0–5.0, step 0.25.
PullbackLevel	1.0	After the thrust, entry arms only while <code>DISP</code> has retraced into the shallow band <code>0..±PullbackLevel</code> . Range 0.1–2.5, step 0.1.
LookbackThrust	6	How many recent bars the qualifying thrust may have occurred within. Range 2–20, step 1.
RsiPeriod	14	Period of the RSI momentum-confirmation filter (≥ 50 for longs, ≤ 50 for shorts). Range 5–40, step 1.
AtrStopMult	1.6	Stop distance as a multiple of ATR. Range 0.5–4.0, step 0.1.
RewardRisk	2.0	Take-profit distance as a multiple of the initial risk. Range 0.5–5.0, step 0.1.
ExitFlipLevel	1.5	Protective early-exit: close if <code>DISP</code> flips beyond <code>±ExitFlipLevel</code> against the position. Range 0.5–4.0, step 0.1.
MaxSpreadPoints	80	Skip new entries when the current spread (points) is wider than this. Range 5–300, step 5.
Lots	0.10	Fixed trade volume in lots. Range 0.01–1.0, step 0.05.
Magic	3719	Magic number identifying this EA's positions (one position per magic). Range 0–9,999,999, step 1.

Recommended Settings

NDP is built for liquid, trending instruments where displacement readings are meaningful and spreads stay tight. Its natural home is FX majors or a major index.

- **Symbols:** EURUSD, GBPUSD, US500 or XAUUSD (liquid majors / indices).
- **Timeframe:** M15 to H1. The EA reads `ctx.PrimaryTimeframe` only and runs on whatever timeframe the chart is set to.

- **Defaults:** the shipped parameters (thrust 2.5, pullback 1.0, 1.6-ATR stop, 2:1 reward) are a balanced starting point across these instruments.

Tuning tips: Raise `ThrustThreshold` to demand stronger impulses (fewer, higher-conviction trades); lower it for more frequent entries. Widen `PullbackLevel` to allow deeper retracements before entering, or tighten it to insist on shallow, trend-respecting pullbacks. Adjust `MaxSpreadPoints` to match your broker's typical spread on the chosen symbol.

Always validate first. Backtest on quality historical data and run on a demo account before committing real capital. The ATR bracket and per-symbol volatility mean the raw point value of stops and targets varies widely between instruments — confirm the resulting risk per trade suits your account.

How to Install on MetaTrader 5

- 1 Copy `NormalizedDisplacementPullback.ex5` to your MT5 `MQL5\Experts\` folder
- 2 Restart MetaTrader 5 and refresh the Navigator panel
- 3 Drag the EA onto a chart matching the recommended symbol and timeframe
- 4 Configure the input parameters and click **OK**
- 5 Enable **Algo Trading** in the MT5 toolbar

Risk Warning

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