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Directional Flow Reservoir

Expert Advisor Documentation

PLATFORM	TYPE	TIMEFRAME	WEBSITE
MetaTrader 5 (MT5)	Adaptive Momentum / Regime	H1 (recommended)	www.algobot.live

> ⚠ **Important Disclaimer** This document is for educational and informational purposes only. It does not constitute financial or investment advice. Trading forex, CFDs, and other leveraged instruments involves substantial risk of loss and is not suitable for all investors. Past backtest performance does not guarantee future results. Never trade with capital you cannot afford to lose.

Overview

The **Directional Flow Reservoir** is an original momentum-regime Expert Advisor built entirely from raw OHLC price data. It uses no classical indicator, no chart pattern, and no support/resistance — instead it models the market as a physical **reservoir** that is filled, bar by bar, with signed "directional pressure" and that slowly **leaks** that pressure back out over time.

The core idea is that a price series alternates between two states: it either converts its activity into **net displacement** (a directional regime worth riding) or it burns that activity as churn with little to show for it (a balanced regime best avoided). When the reservoir level pushes clearly above or below what its own recent behaviour considers normal, a coherent directional regime is in force and the EA takes a position. When the level drains back through zero, the pressure has dissipated and the EA steps aside.

Every threshold in the system is **self-calibrating**: the bar for "significant pressure" is set by the reservoir's own recent dispersion, so the strategy retunes itself every bar rather than relying on a fixed hard-coded level. Risk is equally adaptive — stops and targets are scaled to current volatility using an ATR measured by hand from the price buffer.

> **In one sentence:** Directional Flow Reservoir accumulates signed close-to-close progress into a leaky memory of momentum, then trades when that memory clears a volatility-adaptive confidence band and is still building — exiting the moment the momentum drains away or a volatility-scaled stop/target is hit.

How It Works

1. Typical churn — the self-scaling ruler

The EA first measures the market's characteristic per-bar activity: the average bar range over the last `Window` bars.

```
avgRange = mean( High − Low ) over the last Window bars
```

This "activity budget" makes everything downstream **dimensionless and self-scaling**, so the same logic behaves consistently across symbols and volatility regimes.

2. Directional flow of the just-closed bar

Each completed bar contributes a signed, scale-free measure of net progress:

```
f_t = ( Close_t − Close_{t-1} ) / avgRange
```

A value near `±1` means the bar produced a full range's worth of net travel (high conviction); a value near `0` means churn without progress. Note this is a bar-to-bar displacement relative to a typical range — *not* a close-location value and *not* a windowed efficiency ratio.

3. The reservoir — a leaky integrator

The flow is poured into a fading memory of recent directional pressure:

```
R_t = Retention · R_{t-1} + f_t          (Retention ∈ 0…1)
half-life = ln 2 / −ln(Retention)   bars
```

Old flow decays geometrically while fresh flow is added. A steady one-sided drift charges the reservoir up; two-sided chop lets the leak pull it back toward zero.

4. Self-calibrating confidence band

The threshold for "significant pressure" is derived from the reservoir's own recent behaviour:

```
sigma = stdev of the last Window reservoir readings
band  = ThresholdK · sigma
```

In violent regimes `sigma` is large, so the gate rises and false starts are filtered out; in calm regimes it falls, so the system stays responsive. No fixed threshold is ever hard-coded.

Entry logic

Entries are distinct and symmetric for long and short. The reservoir must be beyond its self-calibrated band **and still building** in the same direction:

- **Long:** `R_t > +band` **and** `R_t > R_{t-1}` (charged bullish and rising)
- **Short:** `R_t < -band` **and** `R_t < R_{t-1}` (charged bearish and falling)

Only **one position per magic number** is ever open — the EA never pyramids.

Exit logic

- **Reservoir release:** a long is closed when `R_t ≤ 0`; a short is closed when `R_t ≥ 0`. The directional pressure that justified the trade has drained away.
- **Volatility stop / target:** every position also carries a hard stop-loss and take-profit set at entry (below).

Dynamic risk

Risk breathes with current volatility using a hand-computed ATR:

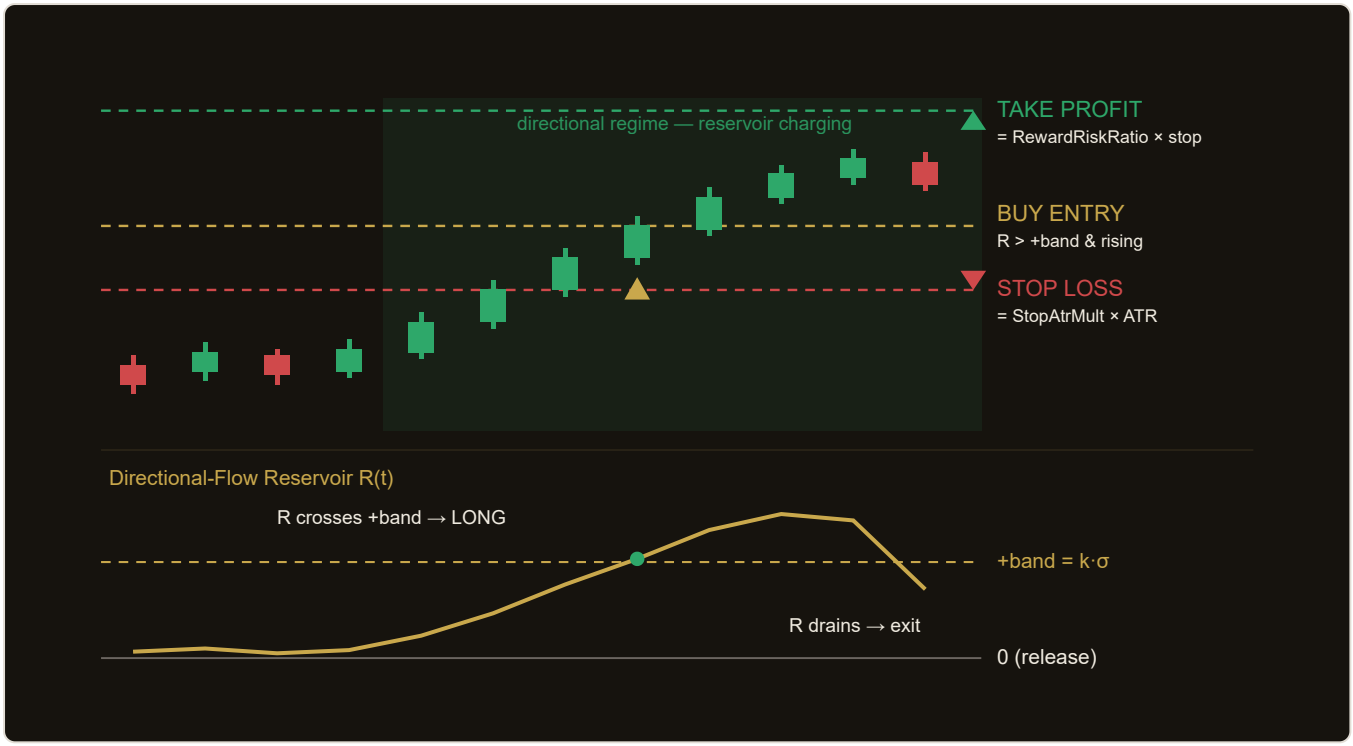
```
stop distance = StopAtrMult · ATR
take-profit   = RewardRiskRatio · stop distance
```

Both distances auto-scale to the regime, so the same parameters remain sensible whether the market is quiet or fast. Position size is a fixed `Lots` value.

> **Note:** The EA acts **once per completed bar** — it reads the just-closed bar, never a still-forming one — so signals are stable and do not repaint. All calculations use a single timeframe (the chart's own period).

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.

Walk-through of the illustration

During the early balanced phase the candles chop sideways and the reservoir `R(t)` hovers near zero — no trade. As a one-sided run develops, each bullish bar adds positive directional flow and the reservoir charges upward. When `R(t)` clears the self-calibrated `+band` while still rising (green marker), a **long** is opened with a stop set `StopAtrMult × ATR` below and a target `RewardRiskRatio ×` the risk above. The trade is closed either when price reaches the take-profit or when the reservoir drains back to zero as momentum fades — whichever comes first.

Parameters

Parameter	Default	Description
Window	`20`	Number of bars used for the typical-churn scale *and* the reservoir-dispersion band. Range 8–60, step 2.
Retention	`0.85`	Reservoir leak retention λ (0.50–0.97, step 0.01). Higher values give a longer directional memory (larger half-life).
ThresholdK	`1.20`	Confidence multiple — how many reservoir sigmas define "significant" pressure. Range 0.50–3.00, step 0.10. Higher = fewer, stronger signals.
AtrPeriod	`14`	Number of bars in the hand-computed ATR used for the volatility stop and target. Range 5–40, step 1.
StopAtrMult	`1.50`	Stop distance expressed in ATRs from entry. Range 0.50–4.00, step 0.50.
RewardRiskRatio	`1.80`	Take-profit as a reward:risk multiple of the stop distance. Range 1.00–4.00, step 0.50.
Lots	`0.10`	Fixed position size in lots. Range 0.01–1.00, step 0.05.
Magic	`4021`	Magic number identifying this EA's positions. Ensures one position per magic and isolates it from other EAs on the same account.

Recommended Settings

The defaults are a balanced starting point. Because every calculation is self-scaling, the same parameters transfer reasonably across instruments — but always validate on your own broker's data before going live.

- **Timeframe:** H1 is a sound starting point. The `Window` and `Retention` pair define the effective memory length, so lower timeframes may want a longer `Window` to avoid noise.
- **Instruments:** Liquid majors (e.g. EURUSD, GBPUSD, USDJPY) and major indices, where clean directional regimes recur.
- **Selectivity:** Raise `ThresholdK` (e.g. 1.50–2.00) to demand stronger, rarer signals; lower it toward 0.80 for a more responsive but busier system.
- **Memory:** Increase `Retention` toward 0.90–0.95 to ride longer trends; decrease toward 0.70 to react faster to regime changes.
- **Risk:** Keep `RewardRiskRatio` ≥ 1.5 so winners outweigh the stop, and size `Lots` to your account so a full `StopAtrMult × ATR` loss stays within your per-trade risk budget.

> **Tip:** Optimise `Window`, `Retention` and `ThresholdK` together — they jointly control how much pressure must accumulate before a trade. Tune the risk block (`AtrPeriod`, `StopAtrMult`, `RewardRiskRatio`) separately once the entry cadence feels right.

How to Install on MetaTrader 5

1. Copy `DirectionalFlowReservoir.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

> **Before going live:** Run the EA in the MT5 Strategy Tester and then on a demo account across several weeks of data to confirm behaviour on your broker's spreads and execution. Because the reservoir needs a full `Window` of bars plus an ATR warm-up before it trades, expect no signals until enough history has loaded.

Risk Warning

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