**Moderate Retain Mode (v1.0)**

**Detailed Description:**  
Version 1.0 implements a classic grid trading strategy optimized for simplicity and reliability. It maintains a fixed grid of buy and sell thresholds relative to the previous price tick and uses a profit‐locking mechanism to secure gains. On each price update, if the percentage change since the last tick falls below the **baseBuyThreshold** (default –0.5%), the bot executes a buy order of a calculated size. Conversely, if the change exceeds the **baseSellThreshold** (default +5%), it executes a sell. Bought lots are recorded in a per-coin grid array, and the cost basis is recomputed as the weighted average of all holdings. Locked profit (20% by default) is withheld in a separate reserve, ensuring incremental cash preservation.

**Configuration Variables:**

* **baseBuyThreshold (–0.5%)**: Trigger level for initiating a buy when the market dips below prior tick.
* **baseSellThreshold (+5%)**: Trigger level for initiating a sell when the market rallies above prior tick.
* **maxTradePercent (50%)**: Caps the maximum USD allocation per trade relative to available cash.
* **profitLockPercent (20%)**: Percentage of each realized profit reserved (locked) and excluded from further trading.
* **minTradeAmount (0.01 USD)**: Floor for the USD size of any trade to ensure meaningful order sizes.
* **cashReservePercent (15%)**: Portion of cash never deployed, maintaining a liquidity buffer.
* **checkInterval (30s)**: Polling frequency for price updates.
* **grid behavior**: Buys are appended to the grid array; sells consume the oldest lots (FIFO) and adjust holdings.

**Moderate Retain Mode (v2.0)**

**Detailed Description:**  
Building on v1.0, v2.0 adds risk controls and dynamic thresholding. It enforces daily caps on buys, profit‐sells, and emergency stop‐loss sells to prevent overtrading, especially in volatile markets. An Average True Range (ATR) calculation over the last 14 ticks generates dynamic buy/sell thresholds: when ATR exceeds fixed thresholds, trades use ATR values for sensitivity; otherwise, they fall back to base thresholds. Additionally, a stop‐loss mechanism triggers a market sell of any position if price falls 30% below cost basis. The strategy computes a minimum profit per transaction as **dailyProfitTarget / sellLimit**, ensuring each sell contributes toward the daily goal.

**Configuration Variables (adds to v1.0):**

* **buyLimit (22 trades/day)**: Maximum number of buy orders per 24 h.
* **sellLimit (23 trades/day)**: Maximum number of profit-taking sells per 24 h.
* **stopLossLimit (5 trades/day)**: Maximum emergency stop-loss executions per 24 h.
* **stopLossPercent (–30%)**: Stop-loss trigger level relative to cost basis.
* **dailyProfitTarget (400.20 USD)**: Target cumulative profit for the trading day.
* **atrLookbackPeriod (14 ticks)**: Window length for ATR calculations.
* **gridLevels (5 levels)**: Segmentation of ATR-based thresholds into equal slices for partial entries/exits.
* **defaultSlippage (2%)**: Assumed execution slippage for live trades.

**Moderate Retain Mode (v3.0)**

**Detailed Description:**  
Version 3.0 refines v2.0 with volatility‐adapted thresholds and trend confirmations. It computes ATR over the last 7 ticks and sets **dynamicBuyThreshold = –ATR** and **dynamicSellThreshold = +ATR**, falling back to base thresholds when ATR is below the fixed minimum. The strategy enforces a **2-of-3 tick confirmation**: if at least two of the last three price movements align (up for sells, down for buys?), only then it considers threshold crossings for execution. Trades are executed against three grid levels, providing finer granularity in scaling in/out. Cost basis gating ensures only positions profitable relative to weighted cost basis are sold, and only buys occur below cost basis, preserving average entry integrity.

**Configuration Variables (v3.0 specifics):**

* **atrLookbackPeriod (7 ticks)**: Shortened for more responsive threshold adaptation.
* **dynamicBuyThreshold/ dynamicSellThreshold**: Computed per tick from ATR, overriding base thresholds when applicable.
* **2-of-3 confirmation**: Guards against false breakouts by requiring majority trend agreement.
* **gridLevels (3 internal)**: Three tiers of ATR threshold multipliers for staggered entries/exits.
* Carries forward all risk and daily-limit settings from v2.0.

**Moderate Retain Mode (v4.0)**

**Detailed Description:**  
Version 4.0 relaxes entry criteria to capture deeper pullbacks while maintaining disciplined exits and confirmations. It retains v3.0’s ATR‐based dynamic thresholds, 2-of-3 tick confirmations, and grid slicing, but adds two new rules:

1. **Flat Profit Exit:** Immediately sells any position once the market price reaches **+5% over cost basis**, regardless of ATR or grid level, ensuring consistent profit-taking.
2. **24h Pullback Entry:** Buys when the current price is **≥10% below the average price over the past 24 hours** (calculated from stored recent tick history), capturing substantial dips.  
   The strategy still requires a 2-of-3 tick confirmation (downs ≥2 for sells, ups ≥2 for buys) and falls back to ATR-grid thresholds if the new flat/pullback rules are not met.

**Configuration Variables (v4.0 specifics):**

* **flatSellThreshold (+5%)**: Profit margin for immediate flat exits.
* **pullbackPct (–10%)**: Drawdown from 24h average price to trigger buys.
* **recent24h array**: Internally maintained list of (price, timestamp) for 24h-average calculation.
* Retains **atrLookbackPeriod**, **dynamic thresholds**, **2-of-3 confirmations**, **gridLevels**, and all daily/stop-loss limits from v3.0.

**Simple Buy Low/Sell High (v1.1)**

**Detailed Description:**  
This streamlined momentum strategy triggers buys and sells purely on one-tick percentage movements but now integrates cost-basis gating for consistency with grid-based strategies. A buy fires when price drops below the **costBasis** by at least **baseBuyThreshold** (–0.5%) relative to the previous tick; a sell fires when price rises above **costBasis** by **baseSellThreshold** (+5%). Each trade still flows through the shared execution engine, which updates the grid array and recomputes the weighted average cost basis after buys and consumes lots FIFO on sells.

**Configuration Variables:**

* **baseBuyThreshold (–0.5%)**: Minimum one-tick downward move to buy if price < costBasis.
* **baseSellThreshold (+5%)**: Minimum one-tick upward move to sell if price > costBasis.
* **costBasis (per-coin)**: Weighted entry price computed in the engine after each buy.
* Shares all sizing, slippage, and limit settings (maxTradePercent, profitLockPercent, buyLimit, etc.) with the grid engine.

**Shared Execution Engine**

**Responsibilities:**

1. **Buy Execution**: Allocates a USD amount based on maxTradePercent and minTradeAmount, applies slippage, pushes a new lot into grid[], and recomputes costBasis.
2. **Sell Execution**: Sells against the oldest grid lots (FIFO), calculates realized profit, locks a percentage via profitLockPercent, and updates cash and holdings.
3. **Limit Enforcement**: Monitors daily buy/sell/stop-loss counters, resetting in demo mode on each start and every 24 h in production.
4. **Formatting & Cadence**: Polls prices at checkInterval (30 s) and logs with priceDecimalPlaces precision.

With these updates, each strategy is clearly documented and configured for both straightforward and advanced grid approaches.