

TECHNICAL SPECIFICATION: MODULAR MULTI-MODE SEMI-AUTOMATED MT5 EXPERT ADVISOR

1. PROJECT OVERVIEW & ARCHITECTURE

This Expert Advisor (EA) for MetaTrader 5 (MT5) is an institutional-grade, highly modular semi-automated trading system coded in MQL5. The software utilizes a strict **State Machine Matrix** designed around a multi-factor sequence: a user-guided or EMA baseline setup phase, an optional momentum filtration phase, and a horizontal structural Pivot breakout trigger.

Critical Architecture Requirement: Every single trend filter, entry condition, and risk rule must operate as an independent functional module. The user must be able to individually toggle (`true/false`) any filter module via master switches in the input settings panel to allow for comprehensive strategy optimization and historical simulation and trading settings options.

2. STRATEGIC PLAYBOOK & LOGIC SCHEMATIC

A. Manual Guideline Interface (`MyHorizontal` & `MyTrendline`)

- **Strategic Purpose:** Combines human visual intelligence with algorithmic execution precision. This removes lagging visual scanning indicators.
 - **Object Filters:** The EA scans exclusively for chart objects named exactly "`MyHorizontal`" (`OBJ_HORIZONTAL`) or "`MyTrendline`" (`OBJ_TREND`). All other user drawings are safely ignored.
 - **Rejection Logic (Trade Off):** Capitalizes on structural price memory. Price must enter the defined `Proximity_Buffer_Pips` boundary, tap or pierce the zone, and bounce. The triggering candle must officially **close outside the buffer zone** on the trade direction side to validate that institutional order flow successfully defended the level.
 - **Breakout Logic (Trade Through):** Capitalizes on order-flow velocity. Price must explicitly cross the active line object, and a candlestick must officially **close on the opposite side** matching your designated trade direction. A subsequent candle must break past the breakthrough candle for a trade to execute.
 - **For a BUY:** Price must break and close above the highest point of the lookback window **plus** your `Candle_Breakout_Buffer_Pips`.
 - **For a SELL:** Price must break and close below the lowest point of the lookback window **minus** your `Candle_Breakout_Buffer_Pips`. [\[1\]](#), [\[2\]](#)
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B. Core Entry Modes & Multi-Factor Confirmation

- **Strategic Purpose:** Eliminates false breakout traps and early entries.
- **The State Machine Rule:** A valid line or EMA interaction only satisfies **Factor 1 (The Setup Flag)**. The EA is strictly prohibited from firing a market order at this moment. The system transitions to an armed state and waits. A market order will execute if and only if **Factor 3 (The Trigger)** occurs: price physically crosses and a candlestick officially **by a stated number of pips** matching the trade direction.

C. Advanced Filtration Modules

- **Candle Body Close Buffer:** Filters out exhausting wicks. The rejection candle must possess a solid body comprising at least `Min_Rejection_Body_Percent` of the candle's absolute range (High to Low). This proves strong momentum is expanding cleanly away from the baseline.
- **Multi-Candle Breakout Filter (Donchian Trigger):** Forces directional velocity. When active, a BUY trade cannot fire unless the executing candle closes higher than the absolute highest wick (or close) of the last `x` completed bars.
- **EMA Geometric Alignment:** Verifies trend regime context. The Fast, Medium, and Slow EMAs must be stacked perfectly in parallel alignment (Fast > Medium > Slow for BUY / Fast < Medium < Slow for SELL).
- **ADX Linear Regression Slope:** Quantifies mathematical acceleration. Rather than relying on a late, raw threshold, the system runs a linear regression model over the past `x` bars of the main ADX line. Trading is disabled if the slope turns negative or if the path smoothness ($\sqrt{R^2}$ coefficient) degrades.
- **Fast EMA Smoothness ($\sqrt{R^2}$):** Eliminates choppy, winding market environments. Uses statistical regression to track the path of the Fast EMA. If the $\sqrt{R^2}$ score drops below a clean threshold, the environment is flagged as erratic market noise, and execution routines are entirely frozen.

D. Advanced Order & Risk Regulation

- **Directional Control Separation:** `Trade_Direction` acts as your localized drawing instruction. It tells the state machine which side of your manual lines to track for wicks and proximity bounces. `Allowed_Trade_Modes` acts as a master global account bias override. If set to Buy Only, it forces a hard code lockout that kills all short trade execution requests, regardless of what you draw.
- **Two-Stage Break-Even Protection:** Protects open float equity. The moment a position floats into profit by a distance matching your exact initial Stop Loss (1:1 Risk-to-Reward milestone), the EA triggers an automated order modification script. It instantly moves the Stop Loss to your entry price plus a tiny pip buffer to structurally insulate your account from commissions, spreads, or slippage.
- **Pivot Proximity Lock:** Prevents chasing overextended breakouts. If price has traveled too far past the initial main pivot breakout coordinate (`Max_Pivot_Distance_Pips`), the system classifies the move as exhausted. The entry flag is deleted, forcing the system to wait for structural value to return.

- **Touch Multiplicity Sequence:** Limits exposure on a single structural setup. If `Max_Trades_Per_Touch` is set greater than 1, the EA can execute multiple successive trades off a single trendline or EMA rejection. However, order loop structures enforce an absolute block: Trade 2 cannot fire until Trade 1 has officially exited the terminal via Take Profit, Stop Loss, or manual closure.
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3. CORE ENTRY MODE DEFINITIONS

The exact execution path of the Factor 1 setup phase and subsequent Factor 3 execution trigger is governed by `EA_Entry_Mode`, `Pivot_Trigger_Execution_Type`, and `Pivot_Breakout_Buffer_Pips`.

Mode 0: MyHorizontal + Pivot

- **Factor 1 (Setup):** The EA scans exclusively for a manual static horizontal line named "MyHorizontal". Price must interact with it based on your chosen `Line_Interaction_Type` (Rejection/Bounce must satisfy the `Min_Rejection_Body_Percent`). Once satisfied, an internal background flag (`Is_Baseline_Ready = true`) is armed.
- **Factor 3 (Execution Trigger):** The armed system ignores all further line interactions and monitors the active horizontal Pivot Line coordinate. Order routing is determined by your chosen execution type:
 - **Type 0 (Candle Close + Buffer):** The EA waits for the active bar to complete. It fires a market order at the open of the next bar if and only if the completed candle closed past the Pivot Line by at least your `Pivot_Breakout_Buffer_Pips` distance.
 - **Type 1 (Live Touch + Buffer):** The EA scans every incoming live tick inside the active, forming candle. The exact millisecond a live price tick penetrates past the Pivot Line by your exact `Pivot_Breakout_Buffer_Pips` distance, it instantly routes a market order to the broker.

Mode 1: MyTrendline + Pivot

- **Factor 1 (Setup):** The EA scans exclusively for a manual diagonal trendline named "MyTrendline". Price must interact with it based on your chosen `Line_Interaction_Type` (Rejection/Bounce must satisfy the `Min_Rejection_Body_Percent`). Once satisfied, the internal background flag (`Is_Baseline_Ready = true`) is armed.
- **Factor 3 (Execution Trigger):** The armed system shifts focus to the active horizontal Pivot Line coordinate. Order routing is determined by your chosen execution type:

- **Type 0 (Candle Close + Buffer):** Executes a market order only if a completed candlestick officially closes beyond the horizontal Pivot Line by a distance $\geq$ `Pivot_Breakout_Buffer_Pips`.
- **Type 1 (Live Touch + Buffer):** Executes a market order the exact microsecond an active intraday tick touches or exceeds the horizontal Pivot Line coordinate plus your `Pivot_Breakout_Buffer_Pips` buffer.

Mode 2: EMA Bounce + Pivot

- **Factor 1 (Setup):** The EA tracks the dynamic price coordinate of the moving average defined by `Bounce_EMA_Period`. Interacting with this moving average is **strictly restricted to Rejection/Bounce logic** (the breakout option is hard-locked out). Price must enter the `Proximity_Buffer_Pips` zone, bounce, and print a completed candle closing outside the zone whose solid body meets the `Min_Rejection_Body_Percent` rule. Once satisfied, the background flag (`Is_Baseline_Ready = true`) is armed.
- **Factor 3 (Execution Trigger):** The armed system tracks the active horizontal Pivot Line coordinate. Order routing is determined by your chosen execution type:
 - **Type 0 (Candle Close + Buffer):** A market order is dispatched only when a candlestick fully completes and closes beyond the main horizontal Pivot line by your specified `Pivot_Breakout_Buffer_Pips`.
 - **Type 1 (Live Touch + Buffer):** A market order is dispatched instantly during the live forming bar the exact millisecond an incoming pricing tick strikes the horizontal Pivot line coordinate adjusted by your `Pivot_Breakout_Buffer_Pips`.

Mode 3: Multi-Line Mode (Any Line + Pivot)

- **Factor 1 (Setup):** The EA actively monitors "MyHorizontal", "MyTrendline", and the bounce EMA simultaneously. The very first asset to experience a valid structural interaction matching your guidelines trips the background flag (`Is_Baseline_Ready = true`) and locks the system into an armed state.
- **Factor 3 (Execution Trigger):** The armed system tracks the active horizontal Pivot Line coordinate. Order routing is determined by your chosen execution type:
 - **Type 0 (Candle Close + Buffer):** Monitors the close of each candle block. It triggers a market order on the next open if the completed candle closed past the main horizontal Pivot line by a minimum of your `Pivot_Breakout_Buffer_Pips`.
 - **Type 1 (Live Touch + Buffer):** Monitors live intraday ticks. It triggers a market order the exact millisecond a live price tick breaks past the main horizontal Pivot line coordinate by your exact `Pivot_Breakout_Buffer_Pips` buffer.

Mode 4: Pivot Only (No Baseline Required)

- **Factor 1 (Setup):** Bypassed entirely. The background flag is permanently set to `Is_Baseline_Ready = true`. The system acts as a pure, standalone horizontal breakout engine.
- **Factor 3 (Execution Trigger):** The system focuses entirely on the horizontal Pivot Line coordinate. Order routing is determined by your chosen execution type:
 - **Type 0 (Candle Close + Buffer):** The EA enters a market order the exact millisecond a candlestick closes past the horizontal Pivot Line by your designated `Pivot_Breakout_Buffer_Pips`.
 - **Type 1 (Live Touch + Buffer):** The EA enters a market order the exact millisecond an active, intraday tick penetrates the horizontal Pivot Line coordinate by your designated `Pivot_Breakout_Buffer_Pips`.

Visualizing how this ties into your Candle Breakout Filter

If you turn on your **Multi-Candle High/Low Breakout Filter**

(`Filter_Candle_Breakout = TRUE`), your developer will map these exact same dual-execution choices (`Candle_Breakout_Execution_Type`) to your Donchian lookback window:

- **Type 0 (Close):** Price must close past the previous 5-candle high/low **plus** your `Candle_Breakout_Buffer_Pips`.
- **Type 1 (Live Touch):** The trade fires the microsecond a live tick touches the previous 5-candle high/low **plus** your `Candle_Breakout_Buffer_Pips`.

The Breakout Math Formula

Regardless of whether your trade setup was born from a manual trendline, a static horizontal line, or an EMA bounce, the final execution trigger always looks at your two core parameters: `Pivot_Trigger_Execution_Type` and `Pivot_Breakout_Buffer_Pips`.

- **If you select Type 0 (On Candle Close + Buffer):**
The EA waits for the candle to close. To fire a trade, that closing price must exceed the Pivot line by your exact buffer distance.
`\(\text{BUY\ Entry\ Condition:\ Candle\ Close}\ge \text{Pivot\ Line\ Price}+\text{Pivot\ _Breakout\_Buffer\_Pips}\)`
`\(\text{SELL\ Entry\ Condition:\ Candle\ Close}\le \text{Pivot\ Line\ Price}-\text{Pivot\ _Breakout\_Buffer\_Pips}\)`
 - **If you select Type 1 (On Live Touch + Buffer):**
The EA does not wait for a close. It monitors the live streaming ticks inside the forming candle. The exact millisecond a tick touches that buffer coordinate, the trade fires.
`\(\text{BUY\ Entry\ Condition:\ Live\ Ask\ Price}\ge \text{Pivot\ Line\ Price}+\text{Pivot\ _Breakout\_Buffer\_Pips}\)`
`\(\text{SELL\ Entry\ Condition:\ Live\ Bid\ Price}\le \text{Pivot\ Line\ Price}-\text{Pivot\ _Breakout\_Buffer\_Pips}\)`
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4. MASTER USER INPUT CONFIGURATION INTERFACE

- **Separate attachment (Input Configuration.pdf)**
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5. VISUAL DISPLAY PROTOCOL

- **Stepped Line Output Requirement:** Intraday pivot points must be rendered onto the chart as a continuous, historical stepped line using an internal indicator data buffer assigned to `DRAW_LINE`.
 - **Isolate Main Axis:** The display logic must strictly plot the Main Pivot Point level (PP). The system must completely hide, suppress, and exclude all surrounding Resistance (`R1`, `R2`, `R3`) and Support (`S1`, `S2`, `S3`) plotting vectors. This generates a clean, single-line horizontal "shelf history" across the chart space.
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6. DEVELOPER COMPLIANCE & SAFETY SAFEGUARDS

- **Native MQL5 Execution Engines Only:** The developer is strictly forbidden from parsing custom, secondary, or external indicators. All data collection routines must poll internal MQL5 system functions (`iMA()`, `iADX()`, `iAO()`, `iATR()`) alongside high-speed array memory buffers via `CopyRates()`.
- **Multi-Feed Decimal Point Normalization:** All user inputs entered as standard pips must be routed through an automated normalization sequence mapped against platform system constants (`_Digits` and `_Point`). This guarantees identical mathematical operations across standard 4-digit, 5-digit, and JPY broker pricing networks.
- **Structural Timeframe Safeguard Loop:** The EA initialization module (`OnInit`) must execute a safety validation check comparing your selected `Pivot_Timeframe` input against the active chart timeframe. If the user accidentally assigns a lower pivot timeframe than the active chart structure (e.g., placing a 5-minute pivot calculation onto an active 1-hour candle chart), the EA must automatically write an error warning to the expert terminal log and safely suspend all entry operations to prevent historical array crashes.
- **Memory Management & Leak Defenses:** The code architecture must feature explicit memory cleanup scripts. Any dynamically allocated chart objects or indicator handles generated during operations must be scrubbed, cleared, and released during platform profile switches, chart adjustments, or terminal de-initialization routines (`OnDeinit`).
- **Backtest tester Adaptability Framework:** To ensure rapid strategy optimization within the MT5 Strategy Tester, the developer must program an automated

background detection script. When running within a simulation profile, the script must automatically translate past structural peaks into internal mock trendline coordinates. This lets the Strategy Tester run at maximum operational speed without requiring a slow, resource-heavy visual-mode test.

- **Visual Display Protocol (MT5 Strategy Tester):** Intraday and daily pivot points must be plotted as a continuous, historical stepped line using an internal indicator buffer (DRAW_LINE). It must strictly display the Main Pivot Point (PP) only, hiding all Support (S) and Resistance (R) levels, matching the visual plotting style of a historical stepped line indicator.
 - **Source Code Required:** For the successful completion of the job, the source code must be provided along with the EA.
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