MECH LAB RESEARCH

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GER40 Regime Adaptive EA

Two independent simulation studies of a regime-adaptive, long-only trading framework for the GER40 (DAX 40) index: a two-and-a-half-year statistical validation, and a six-month verification in the MetaTrader 5 Strategy Tester.

About this white paper. This document describes what the GER40 Regime Adaptive EA does, the testing it has been subjected to, and the results of that testing. It is written for the self-directed trader and the professional allocator alike. It deliberately does not disclose the proprietary construction of the model the specific indicators, lookback lengths and threshold values remain the intellectual property of Mech Lab Research.

Basis of all figures. Every figure in this document is the product of historical simulation: Study I on exported price and signal data, Study II in the MetaTrader 5 Strategy Tester on 100 per cent quality tick data. No figure in this document is a live trading result, and simulated performance is not indicative of future results.

Prepared by Purvang Gandhi, Founder, Mech Lab Research · Instrument: GER40 (DAX 40) Index CFD · Timeframe: H1 · Direction: Long only · Platform: MetaTrader 5

This Expert Advisor is developed and published by Mech Lab Research, a firm focused on market internals. MTS Institute and The Regime Report are sister concerns of the same founder.

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Important notices

Simulated results. All performance figures in this document are derived from historical simulation. They are not live trading results and must not be read as such. Simulated performance has inherent limitations: it is constructed with the benefit of hindsight, and no simulation fully reproduces live execution, liquidity or the psychological conditions of real trading.

Methodology confidentiality. This paper describes the behaviour and testing of the framework, not its internal construction. Indicator choices, lookback periods and threshold values are proprietary and are not disclosed here or in the product listing.

Intended use. The EA is built for self-directed trading accounts. Most proprietary trading firms prohibit third-party Expert Advisors on their evaluation and funded accounts; this product is accordingly not offered or marketed for that purpose. Buyers remain responsible for compliance with the rules of any venue on which they deploy it.

EXECUTIVE SUMMARY

The GER40 Regime Adaptive EA is a fully mechanical, long-only trading system for the GER40 index on the one-hour timeframe. Its defining feature is a proprietary two-state regime model: the system continuously classifies its own trading environment as favourable or unfavourable, trades only in the favourable state, and stands aside, entirely flat, the rest of the time.

Two independent studies support this document. Study I is a statistical validation across two and a half years of hourly data (January 2024 to July 2026), measured at signal level in index points and subjected to Monte Carlo, time-segmentation and transaction-cost testing. Study II is a six-month test of the finished Expert Advisor in the MetaTrader 5 Strategy Tester (January to July 2026) on 100 per cent quality tick data with modelled slippage, on a $50,000 account.

+38.4%	1.48	3.95	14.1%
STUDY II NET RESULT, SIX MONTHS, SIMULATED	STUDY II PROFIT FACTOR	STUDY II SHARPE RATIO	STUDY II MAX EQUITY DRAWDOWN

What the two studies establish

- **The edge is selective, not constant.** In Study I the regime-adaptive configuration was in the market only 15.5 per cent of all hours, yet retained 94 per cent of the unfiltered system's profit while reducing maximum drawdown by roughly 28 per cent.
- **The result is not an accident of trade order.** Across 10,000 random reorderings of the same trades, the configuration's actual historical drawdown sat on the *unfavourable* side of its own distribution. The risk profile is not the product of a lucky sequence.
- **The edge survived every calendar segment.** All five six-month windows of Study I were independently profitable, for both the base and regime-adaptive configurations.
- **The finished EA reproduces the behaviour on platform.** Study II's 121 trades show the same signature: a modest win rate (30.6 per cent) carried by an average win 3.4 times the average loss.

The sections that follow present each study in full, then explain how to read them together.

What the system does

The EA operates on a simple division of labour between two layers. The design reflects Mech Lab Research's mandate as a market-internals firm: rather than forecasting external drivers, the system studies the internal state of the market and of its own performance, and acts only when that internal state is favourable.

Layer one entry engine

A statistical model of price identifies moments when GER40 has stretched to an extreme relative to its own recent behaviour and positions for reversion, always and only from the long side. Positions are opened and closed mechanically at bar close; there is no discretionary input at any point.

Layer two regime model

Running above the entry engine is the component that gives the product its name. The system monitors the statistical state of its own performance and classifies the environment into one of two regimes. In the favourable regime, signals are taken. In the unfavourable regime, no new positions are opened, whatever the entry engine says. The practical consequence is visible in every chart in this paper: extended flat periods in which the system deliberately does nothing, followed by concentrated periods of activity.

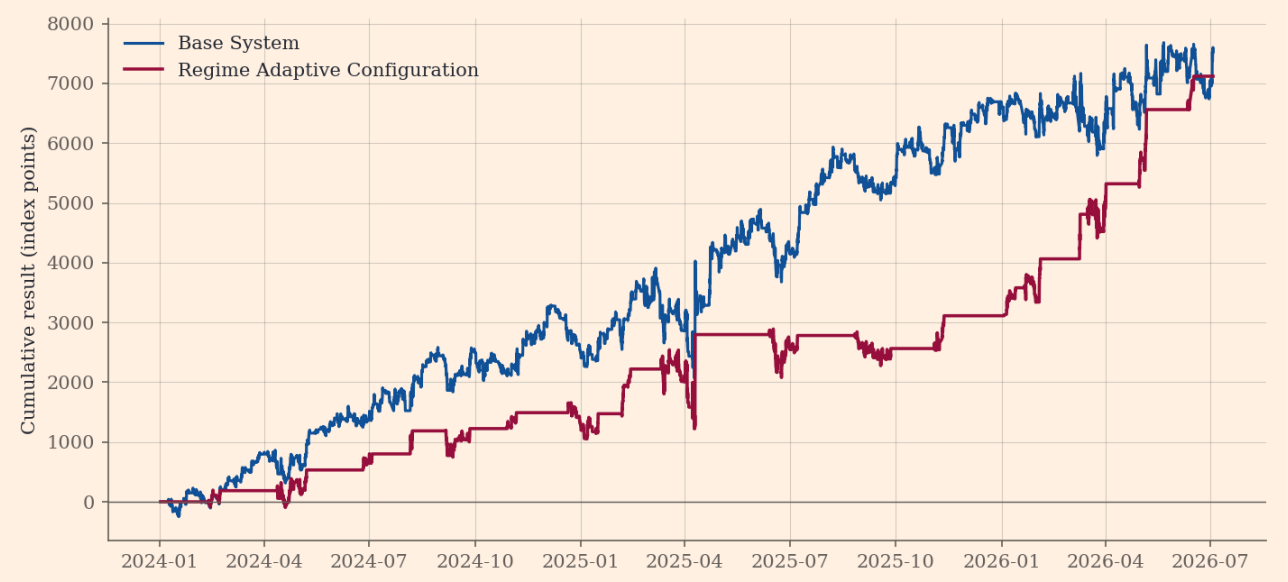
What this design buys, and what it costs

- **It buys drawdown control.** Being out of the market roughly 85 per cent of the time means roughly 85 per cent less exposure to adverse events, which is where the improvement in drawdown and risk-adjusted ratios in Study I comes from.
- **It costs patience.** Flat weeks are a designed feature, not a malfunction. A buyer expecting daily activity will find this system frustrating; a buyer who judges systems on risk-adjusted return will find the flat periods to be precisely the point.
- **It accepts a low win rate.** Roughly two trades in three close at a loss. The economics work because winning trades are, on average, three to four times the size of losing ones. This is stated plainly here because it is the single most common reason unprepared buyers abandon systems of this type.

> **What is not disclosed.** The indicators used, their lookback lengths, the regime thresholds and the exact switching conditions are proprietary. This paper demonstrates *that* the framework works under rigorous testing; it does not provide the recipe for reconstructing it.

Two and a half years, 15,174 hourly bars

Study I measures the framework at signal level, in index points, across the period 2 January 2024 to 3 July 2026. Two configurations are compared: the base entry engine taking every signal, and the regime-adaptive configuration in which the two-state model gates participation.



Cumulative result in index points, base system versus regime-adaptive configuration, Jan 2024 to Jul 2026. Simulated, gross of costs.

METRIC	BASE SYSTEM (RESEARCH CONTROL)	REGIME ADAPTIVE (THE PRODUCT)
Net result (index points)	7,572.5	7,120.1
Maximum drawdown (points)	1,838.4	1,322.3
Sharpe ratio (annualised)	**1.17**	**1.67**
Calmar ratio	**1.65**	**2.15**
Profit factor (trade level)	1.19	1.65
Win rate	32.5%	35.5%
Reward-to-risk per trade	2.46 : 1	2.98 : 1
Trades / trading windows	1,339	417
Time in market	49.4%	15.5%

Signal-level results in index points, gross of spread, commission and slippage (costs are stress-tested on the next page).

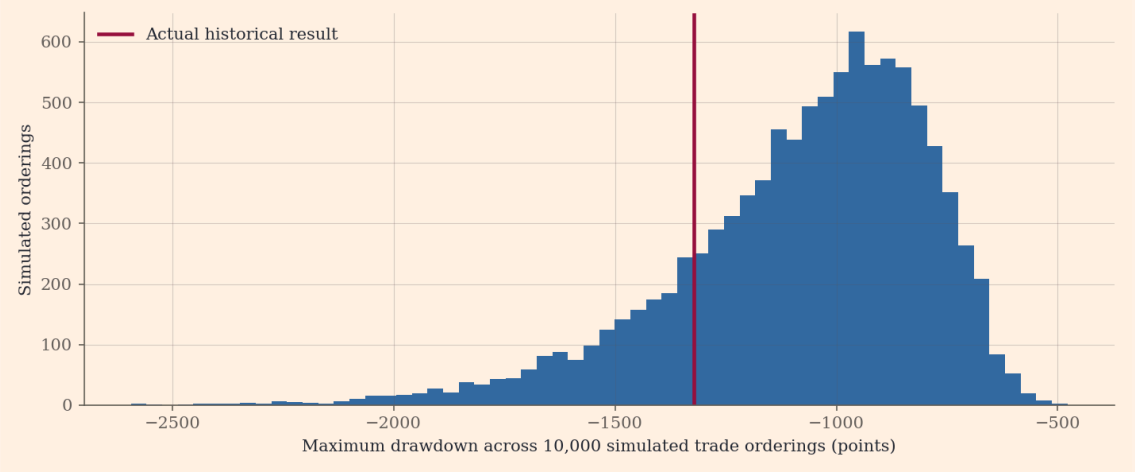
The regime model gives up six per cent of total profit in exchange for a 28 per cent reduction in maximum drawdown and a material improvement in every risk-adjusted measure while sitting flat 84.5 per cent of the time.

> **Why the base system is shown.** The base system serves one purpose in this paper: it is the experimental control that isolates the regime layer's contribution. Without it, "regime adaptive" would be an unverifiable claim. It is not part of the product the EA implements the regime-adaptive configuration only, and the regime layer cannot be disabled.

Attacking the result three ways

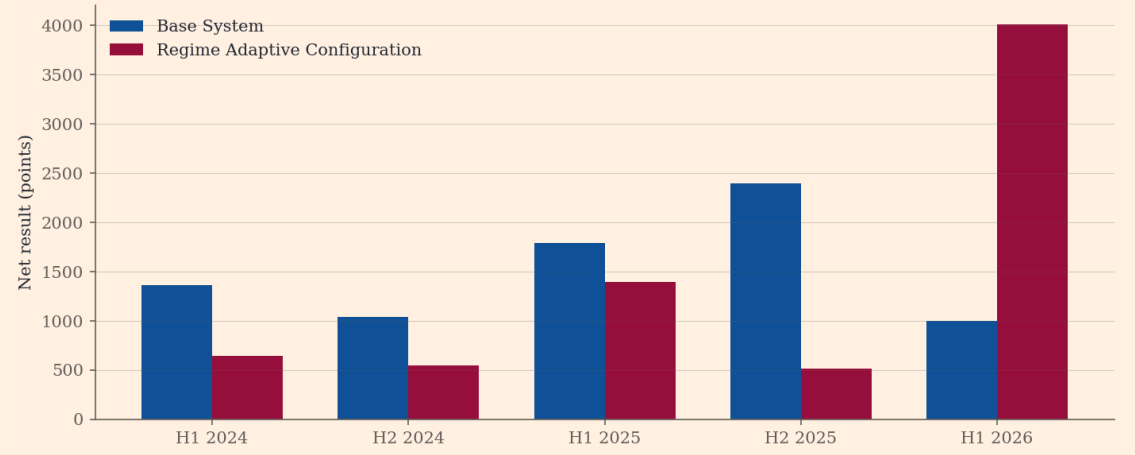
1. Monte Carlo trade-order simulation

The exact historical trades were reshuffled into 10,000 random orderings to test how much of the reported drawdown depends on the lucky or unlucky sequence in which trades happened to occur. Only 17.7 per cent of reorderings produced a worse drawdown than the actual result the configuration's historical drawdown sits on the unfavourable side of its own distribution, and its order-independent median drawdown (1,023 points) is materially *better* than the reported figure.



Distribution of maximum drawdown across 10,000 random reorderings of the same trades, regime-adaptive configuration.

2. Time-segmented consistency



Net result by six-month window. Every window was independently profitable for both configurations.

3. Transaction-cost stress

Re-running the trade record with a flat cost per round trip: at an assumed 3 points per round trip the regime-adaptive configuration retains 82 per cent of its gross result (5,869 of 7,120 points), because it trades 417 times rather than 1,339. Low trade frequency is itself a cost defence.

The finished EA, on platform

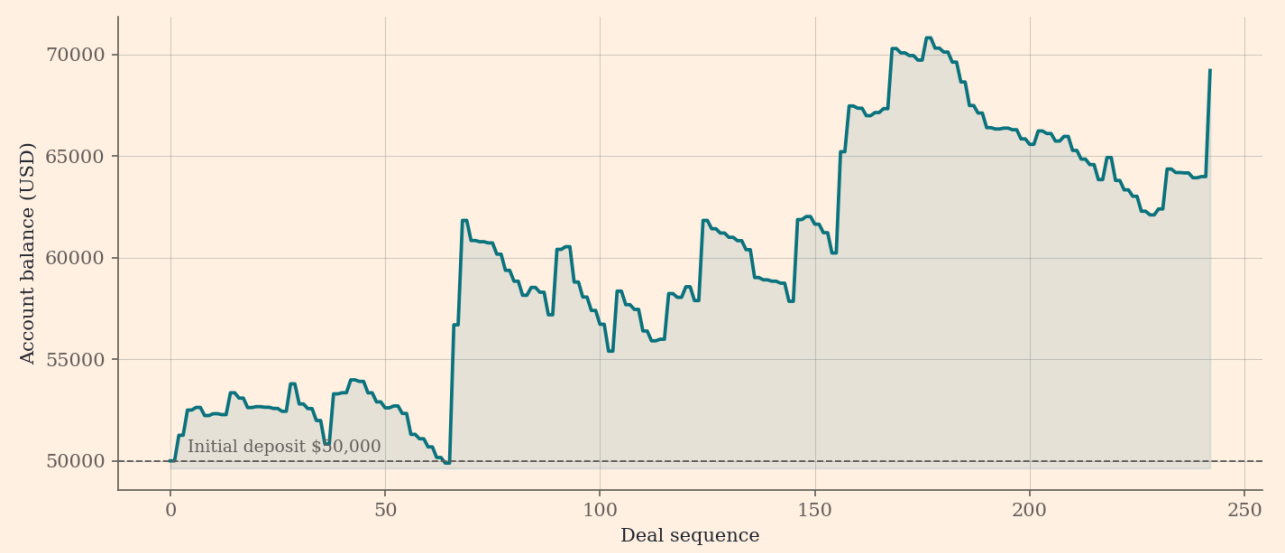
Study II tests the compiled Expert Advisor itself, not the signal logic in the abstract, in the MetaTrader 5 Strategy Tester, over 1 January to 9 July 2026 on GER40 H1. The test used 100 per cent quality tick data (13.2 million ticks), modelled slippage, a $50,000 initial deposit, 1:100 leverage and fixed position sizing. The full, unmodified Strategy Tester report accompanies the product listing.

$19,217
NET PROFIT, SIMULATED

121
TRADES, ALL LONG

3.36 : 1
AVG WIN VS AVG LOSS

12.3%
MAX BALANCE DRAWDOWN



Account balance by deal, MetaTrader 5 Strategy Tester, $50,000 initial deposit, 1 Jan to 9 Jul 2026. Simulated.

METRIC	VALUE	METRIC	VALUE
Net profit	$19,217.31	Profit factor	1.48
Return on deposit	+38.4%	Sharpe ratio	3.95
Total trades	121	Recovery factor	1.90
Win rate	30.58%	Expected payoff	$158.82
Average winning trade	$1,601.11	Balance drawdown (max)	12.31%
Average losing trade	−$476.47	Equity drawdown (max)	14.05%
Largest winning trade	$6,805.77	History quality	100%
Largest losing trade	−$1,739.83	Average holding time	6h 05m

MetaTrader 5 Strategy Tester, FOREX.com Global demo server, build 5836. Simulated results, not live trading.

What the trade record shows under the surface

The economics of a 30 per cent win rate

Eighty-four of the 121 trades closed at a loss. The system was nevertheless comfortably profitable because the 37 winners averaged $1,601 against an average loss of $476 a ratio of 3.36 to one. Ten consecutive losses occurred at one point, costing $3,983, against a maximum consecutive profit run of $11,947. A buyer must be prepared for losing streaks of this length; they are a structural property of the design, not a fault.

Profit tracks opportunity, not luck

The correlation between each trade’s profit and its maximum favourable excursion, the best price reached while the trade was open, was 0.89. In plain terms, when trades made money it was because price genuinely moved in the system’s favour and the system captured it, not because of a handful of fortunate exits. Profitable trades also clustered at longer holding times: losers were cut by the system’s logic within hours, while the largest winners ran for one to two days.

The flat months are visible and intentional

The monthly distribution of entries shows heavy activity in January, March and June, and near-total inactivity in February and July. This is the two-state regime model doing on platform exactly what Study I said it would do: concentrated participation in favourable regimes, and disciplined absence otherwise. A live deployment of this EA will show the same pattern, and the correct interpretation of a quiet fortnight is that the model is working, not that it has stopped.

> **On comparing the two studies’ numbers.** Study I is measured in index points at signal level, gross of costs, over 30 months. Study II is measured in dollars on a specific account size and position sizing, net of modelled slippage, over six months. The figures are therefore not directly additive or comparable in magnitude the next section explains how they corroborate one another.

What to expect, month by month and streak by streak

The worst stretch, in numbers

A buyer should size and prepare for the historical worst stretch, not the average one. From the Study II record:

STREAK STATISTIC	VALUE
Maximum consecutive losing trades	**10 trades (−$3,982.54)**
Maximum consecutive loss by amount	−$5,142.05 (5 trades)
Maximum consecutive profit by amount	+$11,946.77 (2 trades)
Average consecutive wins / losses	2 / 4

MetaTrader 5 Strategy Tester record, simulated. Losing streaks of this length are a structural property of a low-win-rate, high-payoff design.

Month by month

MONTH (2026)	JAN	FEB	MAR	APR	MAY	JUN	JUL*
Net result ($)	−109	+6,806	+1,195	−37	+9,616	−5,069	+6,816
Trades closed	32	1	28	11	7	36	6

*July is a partial month (to 9 July). Simulated. Note February: the regime model authorised a single trade all month and it was the record's largest winner. June was the losing-streak month. Profit is episodic by design; it is not distributed evenly across the calendar.

Deployment questions, answered plainly

- **Does it use martingale, grid or averaging?** No. One position at a time, fixed sizing, long only. No recovery mechanisms of any kind.
- **Which broker?** Any MetaTrader 5 broker offering a GER40 / DAX 40 index CFD. Study II was conducted on FOREX.com Global pricing; spreads and contract specifications vary by broker and should be checked before deployment.
- **Account size?** Study II used $50,000 with fixed position sizing. Smaller accounts should scale position size proportionally so that the historical drawdown, and a margin beyond it, remains comfortably survivable.
- **VPS?** Recommended, as for any EA that must be online at bar close around the clock, though the H1 timeframe makes the system far less latency-sensitive than intraday scalping products.
- **Intervention required?** None. The system is designed to be left alone including, and especially, during its flat periods.

Reading the two studies together

The two studies were run on different tools, at different resolutions, over different horizons, and that is precisely their value: each covers the other’s blind spot.

	STUDY I	STUDY II
What is tested	The signal framework, at signal level	The compiled EA, on platform
Horizon	30 months (Jan 2024 to Jul 2026)	6.3 months (Jan to Jul 2026)
Unit	Index points, gross of costs	US dollars, slippage modelled
Strength	Long horizon; Monte Carlo, segment and cost robustness	Execution realism; 100% tick quality; platform-verifiable
Limitation	No execution modelling	Shorter window; one market phase

The two studies are complementary evidence, not duplicates.

Three points of corroboration

- **Same trade signature.** Study I predicted a win rate near one third with winners roughly three times the size of losers; Study II delivered 30.6 per cent and 3.36 to one. The framework’s character survived the journey from research code to compiled platform product.
- **Same regime behaviour.** Study I’s 15.5 per cent time-in-market reappears in Study II as whole months of designed inactivity, visible in the platform’s own entry distribution charts.
- **Same drawdown order of magnitude.** Study II’s 12 to 14 per cent drawdown at its chosen sizing is consistent with what Study I’s point-level drawdown implies at comparable exposure, including the Monte Carlo finding that the historical figure is, if anything, conservative.

What neither study provides is a live track record. Mech Lab Research’s position on this is stated plainly: simulation, however rigorous, is evidence of design quality, not a guarantee of future performance, and buyers should weight it accordingly.

Who this is for

- Self-directed traders running their own MetaTrader 5 accounts who evaluate systems on risk-adjusted return and are comfortable with a low-win-rate, high-payoff profile.
- Systematic traders seeking a GER40 component whose deliberately low time in market (roughly 15 per cent of hours) makes it a candidate for combination with uncorrelated strategies.

Who this is not for

- Traders who expect daily activity or a high win rate. Two trades in three lose; weeks can pass with no positions at all.
- Users of proprietary trading firm evaluation or funded accounts. Most firms prohibit third-party Expert Advisors and treat identical trade flows across clients as a rule violation. This product is not offered for that use, and deploying it there is likely to breach the firm's terms.

Risk disclosure

- All results in this document are simulated. Simulated performance is prepared with the benefit of hindsight and does not represent actual trading. No representation is made that any account will achieve results similar to those shown.
- Trading leveraged index CFDs carries a high risk of loss, including the loss of the entire amount invested. Leverage magnifies both gains and losses.
- The simulations shown include drawdowns of 12 to 14 per cent and ten consecutive losing trades. Live deployment should be sized so that a materially worse outcome than the historical record remains survivable.
- Study I figures are gross of transaction costs except where stated; live results will be reduced by spread, commission, swap and slippage.
- This document is educational and descriptive. It is not investment advice, a recommendation, or an offer to manage funds. Purchasers should assess suitability against their own circumstances and, where appropriate, take independent advice.

About the publisher. This Expert Advisor is made by **Mech Lab Research**, a firm focused on market internals: the systematic study of the behavioural state of a market and of a strategy itself, of which the regime model in this product is a direct expression. Two sister concerns operate under the same founder. **MTS Institute** provides professional education to market intermediaries, including broker-dealers, odd-lot marketers and analysts, together with their clients and teams. **The Regime Report** is a global capital allocation publication focused on market externals, written for investors, portfolio holders and derivative strategists. The founder's framework is also available as published books on Amazon and as a structured course on Udemy. The unmodified MetaTrader 5 Strategy Tester report underlying Study II is available alongside the product listing.
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