**Universal Backtester Onboarding Guide**

Welcome to the **Universal Backtester** – a flexible framework for systematic trading research, rapid prototyping, and walk-forward optimization. This guide covers core data sources, built-in strategies, parameter spaces, and example workflows for fast onboarding.

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**Overview**

The Universal Backtester supports multi-asset strategy research, optimization, and parameter sweeps across stocks and crypto. With built-in support for Halal (no short selling), session controls, and unified OHLCV data formatting, it's your all-in-one platform for strategy validation.

**Supported Data Feeds**

| **Feed Name** | **Loader Function** | **Typical Use-Case** | **Notes** |
| --- | --- | --- | --- |
| CSV | load\_csv | Custom/historical data | Quick prototyping, local data |
| Yahoo Finance | load\_yfinance | US stocks, indices | Daily, 1min+, equities only |
| Alpaca | load\_alpaca | Stocks/crypto (live/paper) | Requires API key |
| TradingView Data | load\_tvdatafeed | All asset types, fast | No login = limited symbols |
| TradingView TA | get\_tv\_ta | Technical analysis snapshot | Single-bar indicators only |
| Binance | load\_binance | Crypto, spot only | Direct, rate-limited |
| CCXT (multi-ex) | load\_ccxt | Crypto, multiple exchanges | Good for broad asset coverage |

**Note:** All loaders normalize to columns: date, open, high, low, close, volume.

**Built-in Strategies**

**RMA Strategy**

* **Type:** Impulse/Trend-following, session aware
* **Assets:** Stocks, Crypto
* **Halal:** Long-only, no leverage
* **Best for:** Range/Trend assets, intraday and swing

**Crypto Intraday Multi-Signal**

* **Type:** Breakout + momentum + trend + volatility filters
* **Assets:** Crypto
* **Halal:** Long-only
* **Best for:** Volatile, liquid crypto pairs

**SMA Cross**

* **Type:** Classic Moving Average Crossover
* **Assets:** Stocks, Crypto
* **Halal:** Long-only
* **Best for:** Trend capture, simple equities systems

**Crypto Momentum Breakout**

* **Type:** Simple breakout with trailing stop
* **Assets:** Crypto
* **Halal:** Long-only
* **Best for:** Strong trending crypto environments

**Parameter Spaces**

Below are the main parameter sweeps as defined in the platform (CD\_PARAM\_SPACES). Most strategies can be fine-tuned for your asset and timeframe.

**RMA Strategy**

| **Parameter** | **Default** | **Range** | **Step** | **Notes** |
| --- | --- | --- | --- | --- |
| rma\_len | 50 | 40 to 100 | 5 | RMA smoothing length |
| barsforentry | 2 | 1 to 10 | 1 | Min. consecutive green bars |
| barsforexit | 2 | 1 to 10 | 1 | Min. consecutive red bars to exit |
| atrlen | 9 | 2 to 20 | 1 | ATR length for normalization |
| normalizedupper | 0.001 | 0 to 2 | 0.1 | Impulse entry threshold (upper) |
| normalizedlower | -0.001 | 0 to -2 | -0.1 | Impulse entry threshold (lower) |
| ema\_fast\_len | 5 | 2 to 30 | 1 | Fast EMA for trend filter |
| ema\_slow\_len | 60 | 3 to 100 | 1 | Slow EMA for trend filter |
| emasrc | 45 | [15,30,45,60...] | fixed | Source EMA length |
| risklen | 50 | 40 to 0 | -0.5 | Stop loss in % |
| trailpct | 50 | 40 to 0 | -0.5 | Trailing stop in % |
| Session | "13:31"-"19:52" | - | - | Session start/end (HH:MM) |
| maxtradesperday | 1 | - | - | Maximum trades per day |

**Crypto Intraday Multi-Signal**

| **Parameter** | **Default** | **Range** | **Step** |
| --- | --- | --- | --- |
| breakout\_len | 20 | 5 to 51 | 5 |
| momentum\_len | 10 | 5 to 51 | 5 |
| momentum\_thresh | 0.5 | 0.5 to 3.0 | 0.3 |
| trend\_len | 50 | 10 to 100 | 1 |
| atr\_len | 14 | 2 to 20 | 1 |
| min\_atr | 0.5 | 0.1 to 2.1 | 0.2 |
| trailing\_stop\_pct | 2.0 | 0.5 to 5.5 | 0.5 |
| max\_hold\_bars | 3000 | 5 to 50 | 1 |
| maxtradesperday | 20 | - | - |

**SMA Cross**

| **Parameter** | **Default** | **Range** | **Step** |
| --- | --- | --- | --- |
| fast\_len | 5 | 2 to 16 | 2 |
| slow\_len | 20 | 5 to 61 | 5 |

**Crypto Momentum Breakout**

| **Parameter** | **Default** | **Range** | **Step** |
| --- | --- | --- | --- |
| breakout\_len | 20 | 5-100 | 5 |
| trailing\_stop\_pct | 2.0 | 0.5-5 | 0.5 |
| max\_hold\_bars | 30 | 5-100 | 5 |
| maxtradesperday | 20 | - | - |

**Typical Use-Cases**

* **Strategy Optimization:** Use the coordinate descent optimizer to tune any parameter set for maximum Sharpe, Sortino, or profit.
* **Walk-Forward Research:** Export optimized parameter sets and apply walk-forward to test robustness on unseen data.
* **Symbol/Timeframe Portability:** Swap data source (e.g., TradingView, Alpaca, CSV) and re-use the same strategy logic across stocks or crypto.
* **Rapid Strategy Prototyping:** Add new functions and register them in STRATEGY\_REGISTRY to test new alpha signals.

**Sample Workflow**

1. **Load Data**
   * Upload a CSV or connect to an API (e.g., Yahoo, Alpaca, Binance).
   * Select symbol and timeframe.
2. **Choose Strategy**
   * Pick from RMA, Intraday Multi-Signal, SMA Cross, or Breakout.
   * Adjust parameter ranges as needed.
3. **Set Backtest Range**
   * Use the date picker to filter the data for your test period.
4. **Run Backtest**
   * Hit run and view the trade log, equity curve, and summary stats.
5. **Optimize Parameters**
   * Use built-in optimizer for maximum return/risk-adjusted performance.
6. **Export Results**
   * Download trade logs or parameter sets for further research or walk-forward analysis.

**Extending the System**

* **Add a New Data Feed:**  
  Write a loader function (input: config, output: DataFrame w/ date, ohlcv) and register it in the UI.
* **Add a New Strategy:**  
  Write a function: def my\_strategy(df, param1, param2, ...), return trade log DataFrame. Register in STRATEGY\_REGISTRY.
* **Custom Metrics:**  
  Add custom performance metrics to the summary panel for deeper analytics.

**Halal Compliance**

* All strategies are **long-only** (no short selling).
* No margin or interest-based trading.
* Trade caps and risk controls to avoid excessive speculation.

**FAQ & Troubleshooting**

* **"No data returned" error:** Check API keys, symbol names, and network.
* **Session time filter not working:** Make sure your date column is properly parsed to datetime.
* **Strategy not taking trades:** Review entry parameter ranges or check if filters are too strict.
* **API rate limits:** Use CSV or reduce frequency for high-volume data feeds.

**For more info, see the code comments or reach out to the maintainer. Happy backtesting!**