Trading Strategy Documentation

Overview

This document describes the complete trading strategy implementation used by the crypto trading bot. The strategy combines multiple timeframe analysis, regime detection, and sophisticated risk management.

Strategy Components

1. Regime Detection (Daily Timeframe)

Purpose: Determine overall market conditions to filter trade direction.

Indicators:
- 200-period Exponential Moving Average (EMA)
- MACD (12, 26, 9)

Logic:
- **Bullish Regime**: Price > 200 EMA AND MACD > 0
- **Bearish Regime**: Price < 200 EMA AND MACD < 0
- **Neutral Regime**: Mixed conditions

Weight in Confidence Score: 25%

2. Setup Detection (4-Hour Timeframe)

Purpose: Identify favorable market structure for entries.

Indicators:
- Moving Average Stack: 8, 21, 55 EMAs
- ADX (14-period) for trend strength
- ATR (14-period) for volatility

Bullish Setup Requirements:
- EMA8 > EMA21 > EMA55 (ascending stack)
- ADX > 25 (strong trend)
- Price within 2 ATR of EMA8

Bearish Setup Requirements:
- EMA8 < EMA21 < EMA55 (descending stack)
- ADX > 25 (strong trend)
- Price within 2 ATR of EMA8

Weight in Confidence Score: 30%

3. Signal Generation (1-Hour Timeframe)

Purpose: Generate precise entry signals.

Signal Types:

Pullback Signals

- **Bullish**: Price pulls back to EMA21, RSI(14) < 40, then bounces
- **Bearish**: Price rallies to EMA21, RSI(14) > 60, then rejects

Breakout Signals

- **Bullish**: Price breaks above 20-period Donchian high with volume
- **Bearish**: Price breaks below 20-period Donchian low with volume

Divergence Signals

- **Bullish**: Price makes lower low, RSI makes higher low (k=3 pivots)
- **Bearish**: Price makes higher high, RSI makes lower high (k=3 pivots)

Weight in Confidence Score: 35%

4. Confidence Scoring System

Scale: 0-100 points

Components:
- Regime Alignment: 0-25 points
- Setup Quality: 0-30 points
- Signal Strength: 0-35 points
- Penalty Factors: -10 points maximum

Penalty Factors:
- High volatility (ATR > 2x average): -3 points
- Low volume (< 0.8x average): -3 points
- Conflicting timeframes: -4 points

Trade Execution Thresholds:
- Confidence ≥ 70: Full position size
- Confidence 50-69: Reduced position size (0.7x)
- Confidence < 50: No trade

5. Position Sizing

Base Capital: $1000
Risk Per Trade: 0.6% ($6)

Calculation:

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Position Size = (Account Balance × Risk %) / (Entry Price - Stop Loss)
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Ladder Entry System:
- Entry 1: 25% of position size at signal
- Entry 2: 35% of position size on confirmation
- Entry 3: 40% of position size on momentum

Risk Weight Distribution: [0.25, 0.35, 0.40]

6. Risk Management

Dual Stop System

Soft Stop (Composite):
- ATR-based: 1.5 × ATR(14) from entry
- Support/Resistance: Key levels
- Time-based: Close after 48 hours if no progress

Hard Stop (Server-side):
- Fixed at 2% account risk
- Cannot be modified once set
- Guaranteed execution

Crisis Mode

Triggers:
- Account drawdown > 10%
- 3 consecutive losses
- Volatility spike (ATR > 3x average)

Actions:
- Reduce position sizes by 50%
- Increase confidence threshold to 80
- Limit to 1 active position
- Daily review required

7. Trade Management

Entry Rules

1. Wait for all timeframe alignment
2. Confirm with volume analysis
3. Set stops before entry
4. Scale in using ladder system

Exit Rules

1. Take profit at 2:1 risk/reward minimum
2. Trail stops using ATR method
3. Close on regime change
4. Time-based exits for stagnant trades

Position Monitoring

- Real-time P&L tracking
- Stop loss adjustments
- Correlation analysis
- Exposure limits

Implementation Notes

Data Requirements

- 1-minute OHLCV data for signals
- 1-hour data for setup detection

- 4-hour data for regime analysis
- Daily data for long-term context

Performance Metrics

- **Profit Factor**: Target > 1.5
- **Win Rate**: Target > 45%
- **Average Win/Loss Ratio**: Target > 2.0
- **Maximum Drawdown**: Limit < 15%
- **Sharpe Ratio**: Target > 1.0

Risk Controls

- Maximum 3 concurrent positions
- Maximum 5% account risk per day
- Maximum 20% sector exposure
- Daily loss limit: 2% of account

Backtesting Considerations

- Include realistic slippage (0.05%)
- Account for exchange fees (0.1%)
- Model partial fills for large orders
- Consider market impact for position sizes
- Use tick-by-tick data for accuracy

Future Enhancements

1. Machine learning signal filtering
2. Multi-asset correlation analysis
3. Options hedging strategies
4. Dynamic position sizing
5. Sentiment analysis integration

This strategy is designed for educational and research purposes. Past performance does not guarantee future results. Always test thoroughly before live trading.