

Equity Idea Platform Overview

- Founded in 2011, Signal is an **independent analytics firm** dedicated to providing institutional equity investors with actionable insights based on Signal's suite of proven proprietary alpha models.
- Signal has become Wall Street's go to source for **Timing, Crowding/Unwind, and Macro Regime (Risk-On/Off) analysis**, helping institutional equity investors better understand positioning and regime trends at the market, sector, industry and security level.
- Signal's Equity Idea Platform employs a ***cross-disciplinary analytic process*** to achieve superior rankings on over 2,000 securities across 9 sectors.

Why You Should Consider the Idea Platform

- **Regime Analysis** – Signal’s mosaic approach to regime analysis has become Wall Street’s go-to source for industry-level Risk-On/Off recommendations.
- **Industry Tilts and Weighting Recommendations** – Signal helps clients make informed industry-level Risk-On/Off tilts and weighting decisions.
- **Trade Timing** – Signal’s proprietary quantitatively driven Technical model helps clients make alpha generating timing decisions.
- **Crowding Analysis** – Signal’s proprietary Crowding Model identifies securities that are more likely to be over-owned by sector-focused Hedge Fund managers.
- **Unwind Identification** – By analyzing the performance of Signal’s crowded securities, Signal is able to offer insight into unwind activity.
- **Pairing Recommendations** – Signal offers superior pairing recommendations by considering Signal’s regime and crowding factors and characteristics.

Signal's Models Compliment Fundamentals

While most institutional investors have deep fundamental knowledge and access to highly sophisticated risk control platforms, there are other market dynamics (outlined below) that are critical to our clients' success and longevity.



Timing Models
(Global Coverage)

Identifies opportunities and drives consistent and scalable alpha through a ***quant-focused technical model*** refined over ten years of testing and supplemented with our newly developed stretch factor.



Industry Macro Exposure
(US Coverage)

Helps clients ***detect sub-industry Risk-On/Off trends*** which is critical to neutralizing, making informed tilts, and identifying dislocations.



Hypothetical Crowding Model
(US Coverage)

Unlike all other crowding models, ours identifies hypothetical ***crowding of securities by sector-focused I/s managers (i.e. the multi-manager)*** and is used for both alpha generation and risk-control.



Excess Alpha Model
(US Coverage)

Detects anomalies in relative performance at the security level helping to identify idiosyncratic momentum.

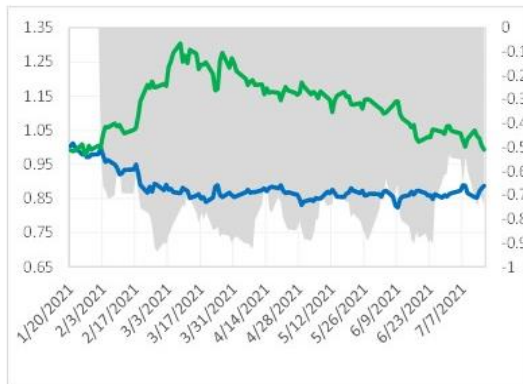
Sample – Equity Idea Platform

Signal's Equity Idea Platform employs a *cross-disciplinary analytic process* to achieve superior rankings on over 2,000 securities across 9 sectors.

CONSUMER – RESTAURANT

RISK-ON

MAINTAIN RISK-ON HAS NOT TURNED YET	
ST TECHNICAL STRETCH OUTLOOK	
RISK-ON - RISK-OFF BASKET	8
OVERALL INDUSTRY	21
HF POSITIONING (SUBJECTIVE)	
SHIFTING BACK TO RISK-OFF	BIAS OFF
RECENT PERFORMANCE:	
PERFORMANCE: RISK-ON/OFF BASKET -5D	-5.3%
PERFORMANCE: RISK-ON/OFF BASKET -1D	-1.1%
MACRO BACKDROP (SUBJECTIVE)	
SIGNAL SECTOR RISK-ON/OFF CALL	BIAS ON
LT MACRO-CALL OUTLOOK	
	BIAS ON



		REGIME EXPOSURE				FUNDAMENTALS		TECHNICALS			STRETCH	INDUSTRY REL PERFORMANCE			
07/19/21		FINAL	-2W	6M		SIGNAL	ABS		ST	4WK	OFF	ON			
NAME	SYM	SCORE	REGIME SCORE	REGIME SCORE	BETA	CROWD SCORE	EXCESS ALPHA	MACRO	PATTERN	SIGNAL SCORE	STRETCH FACTOR	3/10	6/17	YTD	-5 D
												6/16	7/19		
RISK-ON BASKET															
Dave & Buster	PLAY	100	ON 66	78	1.64	(74)	1	65	OS OS	80	(0.87)	-11.3%	-13.0%	2.6%	-5.6%
Bloomin	BLMN	95	ON 71	89	1.49	(70)	17	30	OS OS	40	(0.73)	-3.5%	-2.5%	17.7%	-3.9%
Cheesecake F	CAKE	79	ON 52	89	1.71	(72)	22	35	OS OS	45	0.35	-8.5%	-8.3%	19.5%	-2.9%
Cracker Barrel	CBRL	68	ON 52	7	0.51	(8)	0	30	Bias Up	40	0.41	-14.2%	-4.4%	-8.2%	0.4%
Dine Brands	DIN	67	ON 62	90	1.19	52	15	30	OS OS	35	0.24	5.9%	-7.7%	26.4%	-2.1%
Darden Rest	DRI	53	ON 37	35	0.48	10	14	15	Dip Over	25	(1.03)	-7.5%	6.6%	4.0%	-1.1%
Brinker intl	EAT	46	ON 62	67	1.55	14	(6)	(10)	Bias Up OS	5	0.84	-22.5%	0.6%	-13.2%	-5.6%
Tx Roadhouse	TXRH	23	ON 41	58	0.43	38	18	-	Pullback	(10)	(0.14)	-4.1%	2.5%	5.8%	0.5%
		66	55			(14)	10	24		33	(0.12)	-8.2%	-3.3%	6.8%	-2.5%
NEUTRAL BASKET															
Aramark	ARMK	52	-	9	0.14	18	(5)	75	OS OS	90	0.29	-12.9%	-6.4%	-26.4%	-1.0%
Shake Shack	SHAK	16	-	(5)	(18)	(68)	(15)	10	Bias Up	5	(0.92)	-20.4%	-4.3%	-5.6%	-6.5%
		34	2			(25)	(10)	43		48	(0.32)	-16.6%	-5.3%	-16.0%	-3.7%
RISK-OFF BASKET															
Wendy's	WEN	34	-	(18)	(78)	80	1	80	OS OS	80	(1.11)	13.2%	-4.8%	-14.2%	0.8%
Restaurant	QSR	29	OFF (38)	(72)	-0.86	62	2	95	Bias Up OS	100	(0.76)	3.1%	-5.0%	-11.8%	2.3%
Jack in the Box	JACK	3	-	(25)	(18)	2	3	30	Bias Up OS	40	(0.12)	15.9%	-8.4%	-1.9%	0.8%
Papa John's	PZZA	(35)	OFF (48)	(46)	-0.91	4	11	10	Bias Up	10	0.11	16.9%	9.5%	12.8%	2.8%
Wingstop	WING	(39)	OFF (50)	(77)	-0.98	(40)	4	15	No Signal	-	(0.35)	17.9%	7.2%	1.9%	3.9%
Yum! Brands	YUM	(50)	OFF (63)	(86)	-1.03	84	7	15	Bias Up OS	20	(0.41)	9.4%	0.8%	-8.3%	2.7%
Starbucks	SBUX	(57)	OFF (55)	(76)	-0.79	38	15	(10)	No Signal	-	0.75	-0.2%	9.3%	-4.0%	4.6%
Chipotle Mex	CMG	(58)	OFF (68)	(35)	-0.95	30	8	15	No Signal	-	(0.75)	-5.8%	15.5%	-2.4%	1.0%
Domino's Pizza	DPZ	(65)	OFF (70)	(83)	-1.19	-	29	-	Bias Down	(10)	0.18	21.6%	10.6%	10.9%	4.9%
McDonalds	MCD	(70)	OFF (66)	(86)	-1.08	76	12	(10)	Conflict	(5)	0.67	7.0%	2.4%	-5.6%	4.0%
		-31	(50)			34	9	24		24	(0.18)	9.9%	3.7%	-2.3%	2.8%

The Models that Drive the Platform



Overview: Signal Short Term Timing Model

TECHNICAL MODEL

- Based on a rigorous statistical analysis of both proprietary and non-proprietary technical indicators
- Optimized for consistency to avoid curve fitting performance optimization. Consistent alpha generating results in both US Top 2000 Backtest, Out-of-Sample, Live and also Out-of-Sample universes including Small Cap and International Stocks.

STRETCH MODEL

- Combination of Statistical Regression Analyses to determine when stocks deviate too much from their closest correlated macro variable and industry and sector index's
- Measured in standard deviations stretch from its non-linear regression line

LARGE-CAP (top 2000 US listed equities)

TECH SCORE	6 MONTH LIVE DEC 9, 2020 to PRESENT		3 YEAR OUT-OF-SAMPLE 2018 to 2020		15 YEAR BACKTEST 2003 to 2017	
	# Occ	Annual	# Occ	Annual	# Occ	Annual
85 to 100	744	54.52	14,469	32.66	62,289	43.53
65 to 84	2,612	31.69	30,043	20.29	144,585	18.85
45 to 64	8,662	16.26	62,931	9.65	337,061	8.66
25 to 44	28,669	4.80	155,123	3.38	882,273	3.89
05 to 24	59,469	5.62	313,078	0.49	1,741,429	1.57
0	40,394	(10.80)	150,754	(1.06)	807,847	1.05
-05 to -24	54,496	(0.94)	349,350	(1.87)	1,736,638	(1.14)
-25 to -44	29,836	(0.60)	221,857	(2.09)	997,230	(4.93)
-45 to -64	11,940	(13.30)	104,116	(4.65)	442,117	(9.25)
-65 to -84	3,932	(13.71)	38,801	(8.19)	158,080	(15.81)
-85 to -100	1,187	(15.29)	14,281	(25.50)	53,210	(25.83)

LARGE-CAP (top 2000 US listed equities)

Short Term Stretch Score	2018 to April 2021 Out of Sample		2013 to 2017 Backtest 5 Year Per		2008 to 2012 Backtest 5 Year Per		2003 to 2007 Backtest 5 Year Per	
	% Occur	Ann Ret	% Occur	Ann Ret	% Occur	Ann Ret	% Occur	Ann Ret
82 to 100	1.0%	27.19	0.8%	13.13	0.7%	14.19	0.7%	8.67
63 to 81	0.6%	8.37	0.5%	4.63	0.5%	21.55	0.5%	16.35
47 to 62	1.1%	6.85	1.1%	1.66	1.0%	8.96	1.1%	12.12
27 to 46	4.9%	5.79	5.1%	2.12	4.8%	4.15	5.3%	6.71
3 to 26	30.9%	4.78	31.3%	2.05	31.3%	3.36	32.4%	3.03
2 to -1	19.4%	(3.59)	18.3%	(3.14)	19.7%	0.39	17.9%	(1.76)
-2 to -7	13.2%	2.52	13.2%	0.89	13.1%	0.59	12.9%	(0.23)
-8 to -13	9.6%	(1.15)	10.1%	0.18	9.6%	(2.41)	9.8%	(1.25)
-14 to -18	5.6%	(5.93)	6.0%	(0.51)	5.7%	(4.66)	5.8%	(3.26)
-19 to -27	6.1%	(5.47)	6.5%	(1.98)	6.2%	(6.91)	6.4%	(4.96)
-28 to -46	4.8%	(10.27)	5.1%	(2.72)	5.1%	(9.35)	5.2%	(8.05)
-47 to -65	1.4%	(14.30)	1.2%	(5.74)	1.3%	(11.30)	1.2%	(10.63)
-66 to -90	0.7%	(23.05)	0.5%	(10.94)	0.6%	(18.89)	0.5%	(11.63)
-91 to -100	0.7%	(25.73)	0.3%	(10.72)	0.4%	(8.89)	0.3%	(5.90)

Coverage includes daily technicals on ~3500 US, 2000+ Intl, ETF, Commodities and is fully customizable.

Small-Cap and International Technical Performance

Further validation of the Technical model are evident in the Small-Cap and International universes whose histories are entirely out-of-sample.

SMALL-CAP (100% out-of-sample)

TECH SCORE	6 MONTH LIVE DEC 9, 2020 to PRESENT		3 YEAR OUT-OF-SAMPLE 2018 to 2020		15 YEAR OUT-OF-SAMPLE 2003 to 2017	
	# Occ	Annual	# Occ	Annual	# Occ	Annual
85 to 100	625	79.53	11,255	50.62	47,450	42.51
65 to 84	1,817	50.99	24,288	24.66	111,793	20.88
45 to 64	5,252	21.19	44,110	12.11	234,499	10.28
25 to 44	17,643	13.19	102,318	7.32	593,981	3.75
05 to 24	37,345	17.58	211,551	2.71	1,192,376	1.13
0	40,452	(30.07)	121,041	(1.60)	585,866	(0.04)
-05 to -24	39,115	5.51	271,025	(1.87)	1,359,612	(1.80)
-25 to -44	23,083	(2.79)	174,427	(3.89)	801,578	(4.09)
-45 to -64	9,806	(15.62)	83,492	(6.60)	363,479	(5.96)
-65 to -84	3,261	(39.74)	32,027	(15.82)	135,285	(10.61)
-85 to -100	1,069	(71.05)	12,556	(35.10)	49,691	(22.02)

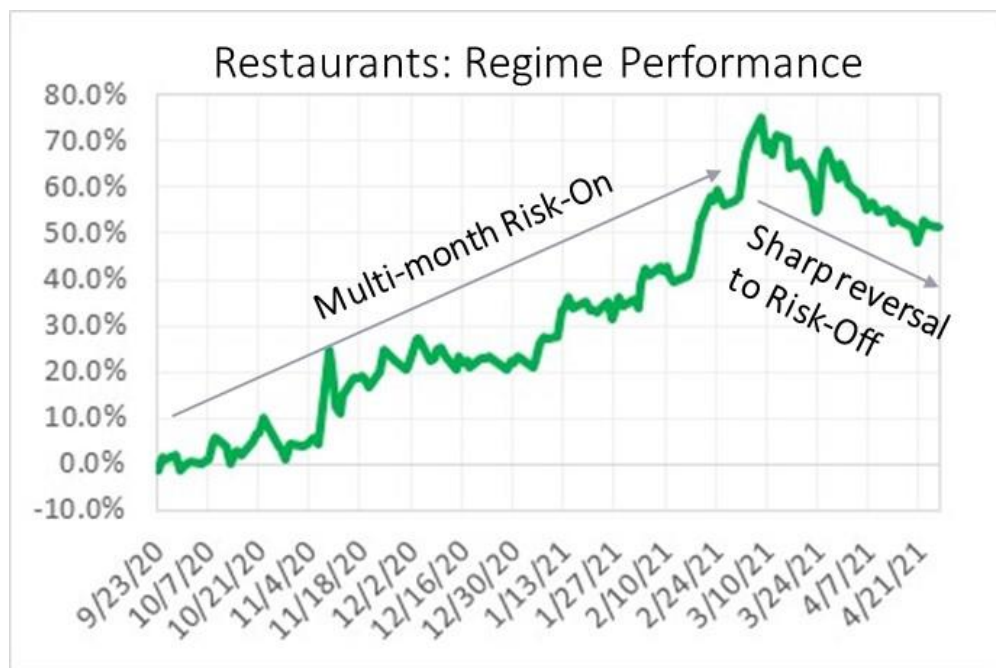
INTERNATIONAL EQUITIES (100% out-of-sample)

TECH SCORE	RECENT OUT-OF-SAMPLE 2018 to PRESENT		HISTORICAL OUT-OF-SAMPLE 2003 to 2017	
	# Occ	Annual	# Occ	Annual
85 to 100	14,423	31.04	43,202	57.07
65 to 84	31,645	16.78	104,866	27.61
45 to 64	67,429	7.06	242,737	14.36
25 to 44	169,915	2.57	651,387	3.81
05 to 24	350,805	(0.37)	1,306,910	(0.00)
0	178,604	2.95	599,763	0.34
-05 to -24	403,938	(0.90)	1,378,195	(1.29)
-25 to -44	253,670	(1.89)	799,850	(4.42)
-45 to -64	118,803	(6.12)	360,673	(8.12)
-65 to -84	44,451	(9.13)	133,071	(14.54)
-85 to -100	16,132	(18.99)	46,412	(29.22)

**Returns are based on holding each signal for exactly 5 days and annualizing the returns. Returns do not include transaction costs or slippage.*

Overview: Regime Risk-On/Off Model

For each sub-industry, Signal monitors the performance of an equal weighted Risk-On versus Risk-Off basket as part of a process to identify trends and potential inflection points.

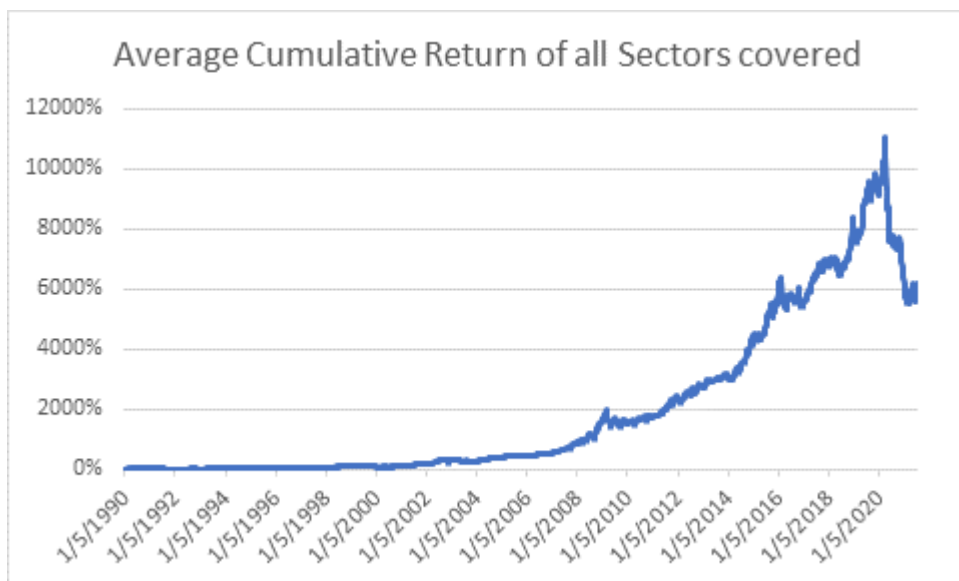


Regimes can be powerful and long-lasting with violent reversals

- Each industry has radically different dynamics and therefore neutralizing factors at the portfolio level does not neutralize these powerful industry preferences.
- The Signal process enables clients to minimize unintended macro regime biases while allowing for controlled regime bias during periods of high conviction.
- Each security is scored in terms of Risk-On/Off and proprietary beta to the Risk-On/Off Basket.

Overview: Crowding Model

To construct a model that is more meaningful to our clients, Signal employs several unique, proprietary techniques that provide superior identification of crowded equities among L/S sector focused hedge funds (i.e. the multi-managers).



- Signal's model employs factors that produce returns that are highly correlated to sector focused L/S hedge fund performance data.
- A byproduct of our analysis shows crowded stocks, as we define them, deliver significant risk adjusted returns versus the universe we tested. Signal's model (backtest plus live results) has a ~14% annual return over a 32-year history.*
- While we consider crowding a long-term alpha model, Signal's model enable clients to control crowding risk during unwind periods.

*Performance based on equal-weighted basket of top 10% crowded longs vs top 10% crowded shorts rebalanced weekly. Does not include transaction costs or slippage.

Signal's User's Guides



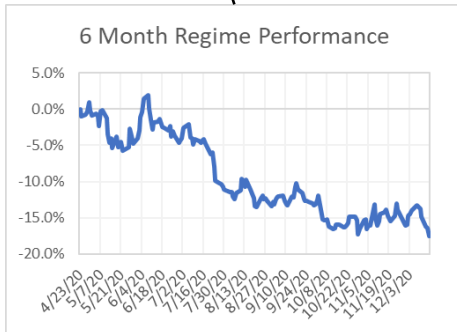
USER GUIDE - EQUITY IDEA PLATFORM



GENERAL NOTES:

- Numeric Scales** – Most Scores, including Final Rank, Regime Score, Crowd Score, Technical Score, are based +/- 100; The highest absolute signals are our strongest. The Stretch Factor is displayed as a standard deviation.
- Color Coding** – Dark green represents our strongest positive signals, followed by light green. Red represents our strongest negative signals, followed by yellow. Grey is neutral.
- Final Score** – We recognize our clients most likely cannot run a book as our final rank suggests as the macro tilt (and volatility) would be far too extreme. Our Final Rank is intended to highlight names that are most likely to work long/short in the macro regime we are predicting. For those who do not wish to make extreme regime bets, we would suggest pairing names with similar regime scores.

REGIME CHARTS – represent the performance of industry baskets constructed with the strongest Risk-On names long vs. the strongest Risk-Off names short. An upward sloping chart indicates a Risk-Of regime, while a downward sloping chart indicates a Risk-Off regime. For example, the chart below displays a Risk-Off regime.



FINAL SCORE and COMPONENTS – Final Score based on Component Models, which include Regime (Risk-On/Off), Crowding, Excess Alpha, Technicals, and Stretch. We employ a dynamic weighting system.

6M REGIME BETA – Indicates individual security's Beta to its respective Macro Regime. In this example, TRIP has a very high Beta of 2.48 which indicates it has a very high sensitivity (high "torque") to a Risk-On environment.

STRETCH FACTOR – Identifies when a name has become too "stretched" and likely due for a reversion. We calculate the stretch versus several macro indicators and peer performance. In this example, TRIP, with a -1.51 (std dev) is stretched to the downside and likely due for a bounce.

INDUSTRY RELATIVE PERFORMANCE – we display industry level relative performance during the most recent Risk-On/Risk-Off periods which is helpful to understand when names are not "acting" as we would expect.

04/23/21			REGIME EXPOSURE			FUNDAMENTALS		TECHNICALS		STRETCH	INDUSTRY REL PERFORMANCE				
NAME	SYM	FINAL SCORE	REGIME SCORE	REGIME SCORE	REGIME BETA	SIGNAL CROWD SCORE	ABS EXCESS ALPHA	ST TECHNICAL PATTERN	SIGNAL SCORE	4WK σ STRETCH FACTOR	OFF 3/18	ON 4/8	YTD	-5 D	YEST
RISK-ON BASKET															
Tripadvisor	TRIP	82	ON 73	54	2.48	(92)	100	Bias Up OS	20	-1.51	-14.3%	-4.3%	62.1%	-3.0%	-1.4%

REGIME (RISK-ON/OFF) SCORE – Our primary offering. Color coding indicates the current Macro Regime selection (when Risk-Off is green, our current Macro Regime selection is Risk-Off and vice versa). The process in scoring each stock is three steps:
 1) Based on 20 years of history, we selected sector-level Risk-On/Off regimes and constructed factor models based on the factors that "work" long/short during those regimes. The models are then run each week to score each name in our universe. The result is a "raw" sector-level factor-based score for each stock.
 2) Based on the "raw" sector-level scores, we compare each security to its industry peers and derive and industry-level relative score for each stock.
 3) Lastly, given stocks do not always "act" as we would expect, we employ correlation analysis and adjust our Risk-On/Off score accordingly.

TWO WEEK CORRELATION – we correlate each stock to the Risk-On/Off basket to highlight when a name is "acting" as we would expect or is potentially decoupled, which can be very useful in selecting appropriate pairs an/or identifying names that may revert to the mean.

CROWDING – While most crowd scores are based on short interest alone, we created a superior model that employs factor analysis in addition to short interest to predict crowding among sector specific L/S managers. It turns out that, over time, you want to be long our crowded longs and short our crowded shorts. In this example, TRIP has a very negative score, indicating it is a very crowded short.

Our **TECHNICAL SIGNALS** are quantitatively and statistically derived from proprietary signals and patterns. See the following page for more details.

EXCESS ALPHA – a non-linear regression model in which we "remove" any performance derived from Sector, Industry, or Regime (Risk-On/Off). The resulting score shows the excess or idiosyncratic alpha. Our analysis shows excess alpha usually continues; However, it should be noted, names can revert when overly stretched.

SIGNAL USER GUIDE - TECHNICALS



GENERAL NOTES:

- Unlike traditional technical analysis, **Signal's approach is based on a rigorous statistical analysis** of both proprietary and non-proprietary technical indicators, and therefore **objective and quantifiable**.
- Backtested over a 18-year history. **To avoid curve-fitting, the 18-year history was divided into 3 x 5-year periods with a 3-year out-of-sample.**
- The final signal is combination of 2 separate models. The **Primary Signal is a proprietary complex trend indicator**, and the **Secondary Signal is a complex oscillator** similar to an RSI or Stochastic, which identifies an overbought or oversold condition.
- Numeric score is based on a scale of +/- 100; The **highest absolute signals are our strongest**.
- The Pattern Description generally describes the Primary Signal; however, an overbought or oversold condition identified by our Secondary Signal (oscillator) is displayed after "|" with an "OB" or "OS".

PRIMARY SIGNAL – based on complex trend indicator

Very OB Extremely overbought in the short and intermediate-term

IT OB Intermediate-term (4-6 week) overbought

ST OB Short-term (5 day) overbought

Uptrend Existing uptrend with more to go

Bias Up Choppy with a bias to the upside

Pullback Expect a multi-week pullback

ST Pullback Expect a multi-day pullback

Dip OverPullback over

ComplexVery complex statistical pattern

Conflict Conflicted indicators – numerical signal displays the net of the conflict

No Signal No meaningful signal

Bounce Over Bounce over

ST Bounce Expect a multi-day bounce

Bounce Expect a multi-week bounce

Bias Down Choppy with a downward bias

Dntrend Existing downtrend with more to go

ST OS Short-term (5 day) oversold

IT OS Intermediate-term (4-6 week) oversold

Very OS Extremely oversold in both the short and intermediate term

SECONDARY SIGNAL – based on complex oscillator

OB Overbought

OS Oversold