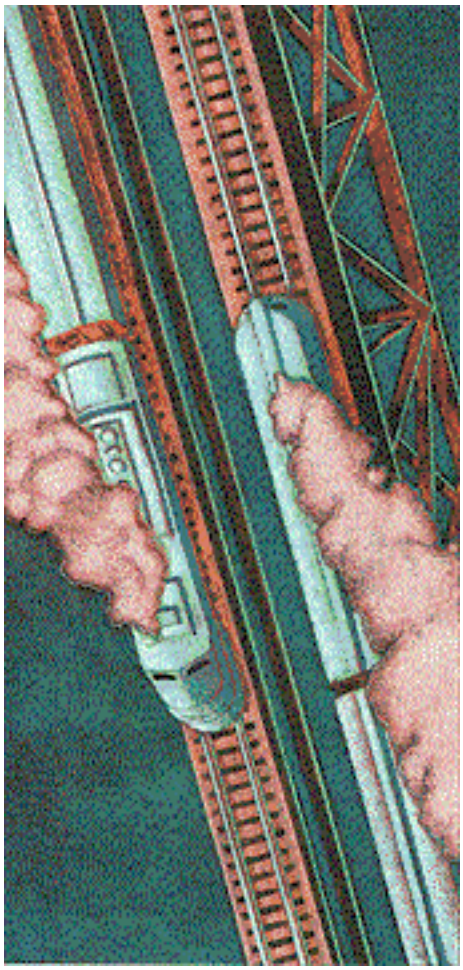
INDICATORS

The Insync Index



Here's a method to graphically display the signal status for a group of indicators as well as an algorithm for generating a consensus indicator that shows when these indicators are in sync. The methods described can be used with any group of indicators.

by Norm North

Using the presignal concept as a base, the algorithm for creating the Insync index, which is a consensus indicator, is simple and obvious - once you see it. It works consistently well, almost always outperforming its component indicators. A user should be able to implement and test it, to some extent using many of the more comprehensive technical analysis programs available today. Basically, the Insync index shows that when a majority of indicators is in sync, a turning point is near. By using the index as a filter, large databases can be scanned quickly

to identify issues that may be about ready to reverse their trend.

OVERCOMING OVERLOAD

Only a few years ago, analysts could spend a few hours with their personal computers and favorite software programs and come up with several good candidates for trading from a database of 30 or so stocks, keeping up with their studies on an interactive basis. At present, however, considering the abundance of low-cost technical data available and the speed and capacity of current computers, it is not unreasonable for individual investors to want to search through a database of several thousand stocks to find those that offer the best opportunities. What the investors would like to do is check a wide array of indicators of their choice as well as other criteria before making an investment decision.

The problem: Although the information is available when the investors want it, there's just not enough time to go through it all! Looking at the output of three to four indicators for several hundred issues isn't practical. How does an investor condense the information generated by these indicators into a form that conveys only the pertinent portion of each indicator's output? One way is to create a consensus indicator that essentially represents the output of the component indicators, reducing the analysis time required by a factor of the number of indicators involved.

The first task in creating a consensus indicator is determining when and how the component indicators support and interact with each other. One approach is to check for the latest buy or sell signal from each indicator, weight it exponentially according to age (that is, how long ago it fired) and add up all these weighted values (plus for sell and minus for buy).

While this method works fairly well, it is not feasible to wait for the indicators' signals. By the time a majority of indicators have issued their signals, the time to act is long past. What is needed is a precursor to indicator signals, something that can be defined logically so that it can be incorporated into software. The answer can be found in indicator presignal areas. (An indicator is said to enter its presignal area when it is committed to fire a signal.)

THE PRESIGNAL CONCEPT

The algorithm for calculating the Insync index is based on the presignal areas of component indicators, which can be defined as two general types: the threshold-crossing indicators such as the relative strength index (RSI) and %K, and the zero-crossing oscillators such as the rate of change (ROC) and the moving average convergence/divergence (MACD) indicators.

The threshold-crossing indicators usually have minimum and maximum extremes that are not exceeded, like zero and 100 for RSI and %K. The zero-crossing oscillators, on the other hand, do not usually have definite limits. Both types of oscillators generate signals when the indicator crosses a buy line or a sell line. For threshold-crossing indicators, these buy and sell lines are the lower and upper thresholds (constant values), respectively. A buy signal occurs when the indicator is below the lower threshold and then crosses above it, while a sell signal is generated when the indicator is above the upper threshold and then crosses below it. Examples of both occurrences can be seen in Figure 1.

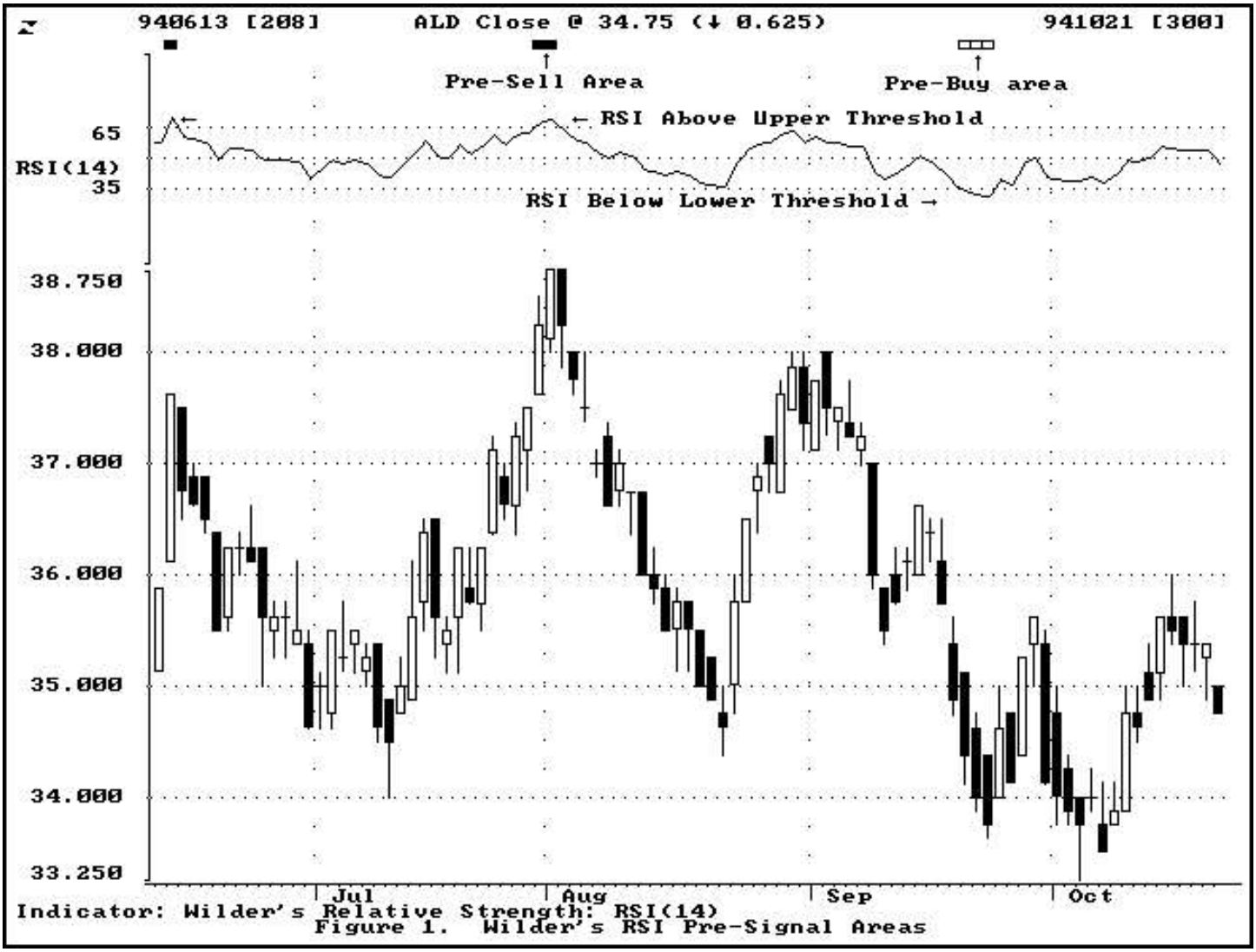


Figure 1. Wilder's RSI Pre-Signal Areas

FIGURE 1: ALLIEDSIGNAL INC. *This chart shows Wilder's RSI presignal areas, buy and sell lines, and lower and upper thresholds. A buy signal occurs when the indicator is below the lower threshold and crosses above it.*

This type of indicator is committed to fire a buy or sell signal whenever it first descends below the lower threshold or rises above the upper threshold, respectively. It is simply a matter of time before it fires a signal. A threshold-crossing indicator is in a prebuy signal area when it is below the lower threshold and in a presell signal area when it is above the upper threshold.

The presignal concept is not new. Greg Morris and I first used presignal areas for filtering candlestick signals with %D in 1991. The presignal areas are the same as the overbought and oversold areas historically used with threshold-crossing indicators. We extended the presignal concept to zero-crossing oscillators, for which overbought and oversold areas were not defined then but can be now, and that is one of the reasons for the different terminology. The other more important reason is that, as the term implies, the indicator is committed to fire a signal when it is in its presignal area.

The presignal area concept can also be defined for zero-crossing oscillators. With these indicators, a signal is issued when the indicator crosses a trailing moving average buy line or sell line. (Usually the buy line and sell line are the same moving average.) Both buy and sell signals can be seen in Figure 2. As depicted, a buy signal is issued when the indicator is below the buy line moving average and then crosses above it when the buy line is less than zero.

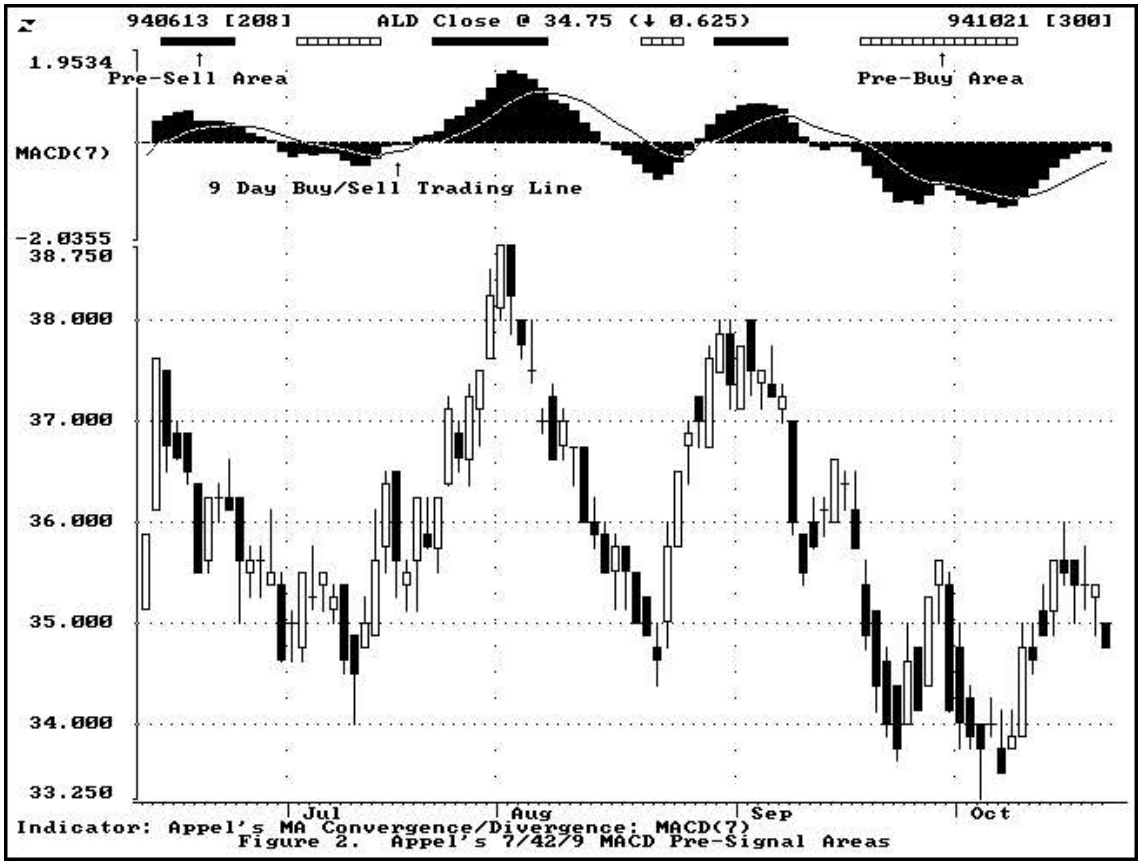


FIGURE 2: MACD PRESIGNAL AREA CONCEPTS. *The presignal area concept can also be defined for zero-crossing oscillators. With these indicators, a signal is issued when the indicator crosses a trailing moving average buy line or sell line.*

Conversely, a sell signal is generated when the indicator is above the sell line moving average and then crosses below it when the sell line is above zero. Thus, for zero-crossing oscillators, the prebuy signal area starts when the indicator is below the buy line and the buy line first goes below zero, because the indicator is committed to fire a buy signal then. Similarly, the presell signal area starts when the indicator is above the sell line and the sell line first goes above zero, because it is committed to fire a sell signal. Again, a signal is inevitable.

For both indicator types, the presignal areas show when an indicator is committed to fire either a buy signal or a sell signal. In Figures 1 and 2, these areas are easily identified by sequences of open boxes (prebuy and bullish) and solid boxes (presell and bearish). By definition, a signal is issued at the end of a presignal area. When two or more indicators are in the same presignal area, they are in sync with each other, committed to fire the same type of signal.

CHARTING PRESIGNAL AREAS

Figures 1 and 2 each show the history of one indicator along with sequences of open and solid boxes showing when that indicator was in its respective prebuy and presell signal areas. What can be done when you want to compare two or more indicators - say, 10?

In that case, two indicators can be compared by vertically stacking just the indicator plots, as can be seen in Figures 1 and 2. While this can also be accomplished for three or four indicators with less satisfying results, plotting all this information for 10 indicators stacked on top of each other on a single chart becomes hard to read. One alternative would be to chart each indicator in its own window, but not having a common time line makes comparisons difficult. A compromise becomes necessary. The most important factor is whether an indicator is primed to fire, so just plotting the presignal areas displays germane information. By giving up the less relevant details, a great deal of information can be conveyed on a single chart.

Figure 3, an example of this concept, displays the presignal areas for 10 indicators along with the price. Pertinent information concerning the 10 indicators and how they relate to price and to each other can be seen at a glance. For

each of the 10 indicators, the prebuy signal areas are shown by sequences of open boxes and the presell signa areas are shown by solid boxes. It is important to remember that each one of these sequences, regardless of length, terminates with a buy or sell signal. Visualize a down arrow at the end of each sequence of solid boxes and an up arrow at the end of each sequence of open boxes.

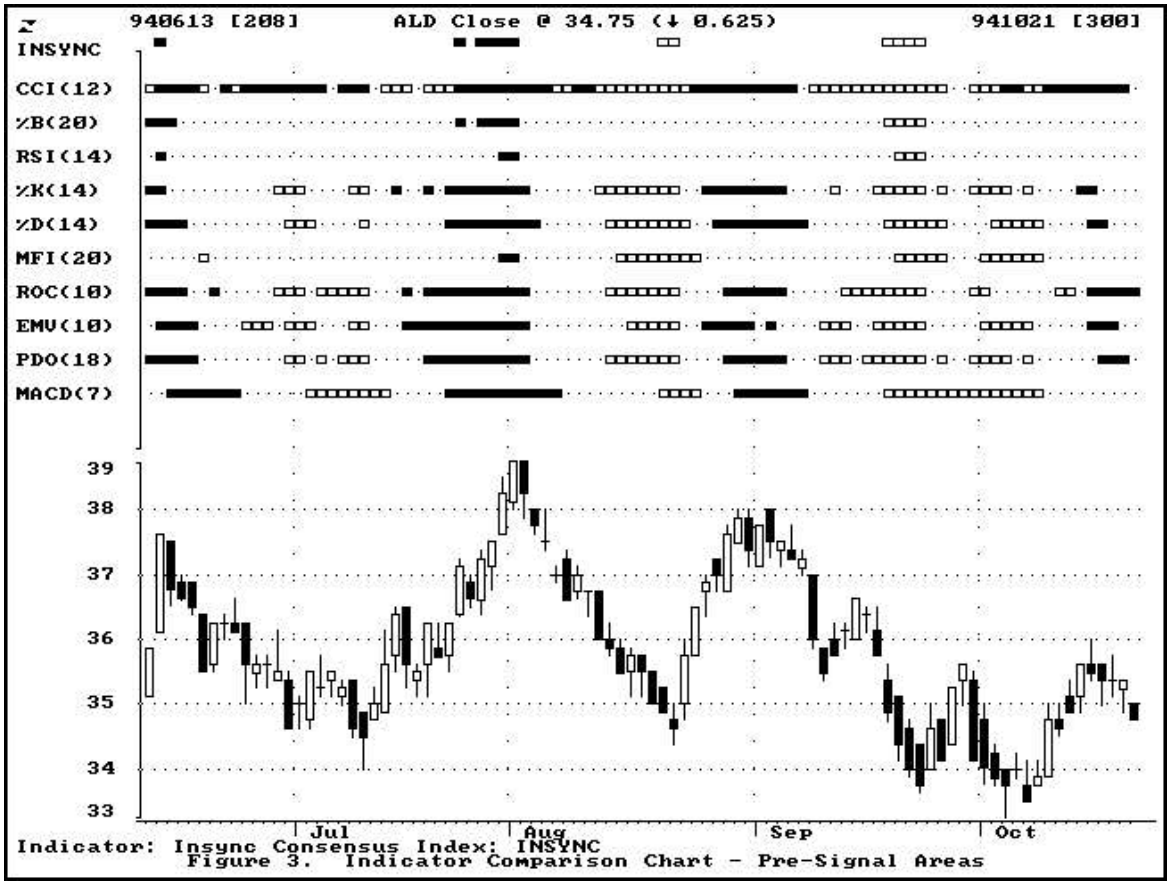


FIGURE 3: PRESIGNAL AREAS FOR 10 INDICATORS. *Pertinent information concerning the 10 indicators and how they relate to price and to each other can be seen at a glance.*

In Figure 3, the first presignal sequence pertains to the consensus indicator (that is, the Insync index). The 10 component indicators used here are identified by acronym along with the number of periods used in their calculation (Figure 4). The number and length of presignal areas vary significantly for each indicator, and many of the indicators issue spurious signals to some extent, which is representative of what is generally observed. For any given period, indicators are said to be in sync if they are in the same prebuy or presell signal area. As shown in Figure 3, the price is usually approaching a local high or low where the number of indicators that are in sync is near a maximum.

These cases are identified by the sequences of boxes at the top of Figure 3. The sequences show when 80% or more of the indicators are in sync; at least eight out of 10 are in prebuy areas (open boxes) or in presell areas (solid boxes). The percentage threshold can be changed to any desired level. These sequences at the top of the chart form the basis for creating the Insync index.

FORMING A CONSENSUS INDICATOR

Figure 5 shows the same data in Figure 3, plus the Insync consensus indicator plotted at the top of the chart. The values of the consensus indicator are simply the net sum of all its component indicators' prebuy and presell signal areas at any given time, expressed as an index - the Insync index. For each point in time, the consensus indicator reflects the net sum of the prebuy (minus) and presell (plus) signal areas displayed directly below it. The scaling is from zero to 100, with zero representing the condition where all the indicators are in their prebuy signal areas, and 100 indicating that all the indicators are in their presell signal areas. A value of 50% is neutral (prebuys equal presells).

COMPONENT INDICATORS	
Name	**Type of crossing**
Lambert's commodity channel index (CCI)	Threshold
Bollinger's oscillator (%B)	Threshold
Wilder's relative strength (RSI)	Threshold
Lane's stochastic oscillator (%K)	Threshold
Lane's stochastic oscillator (%D)	Threshold
Money flow index (MFI)	Threshold
Price rate of change (ROC)	Zero
Arms' ease of movement value (EMV)	Zero
Price detrend oscillator (PDO)	Zero
Appel's convergence/divergence (MACD)	Zero

FIGURE 4: *Here, the 10 component indicators are identified by acronym as well as the type of crossing used.*

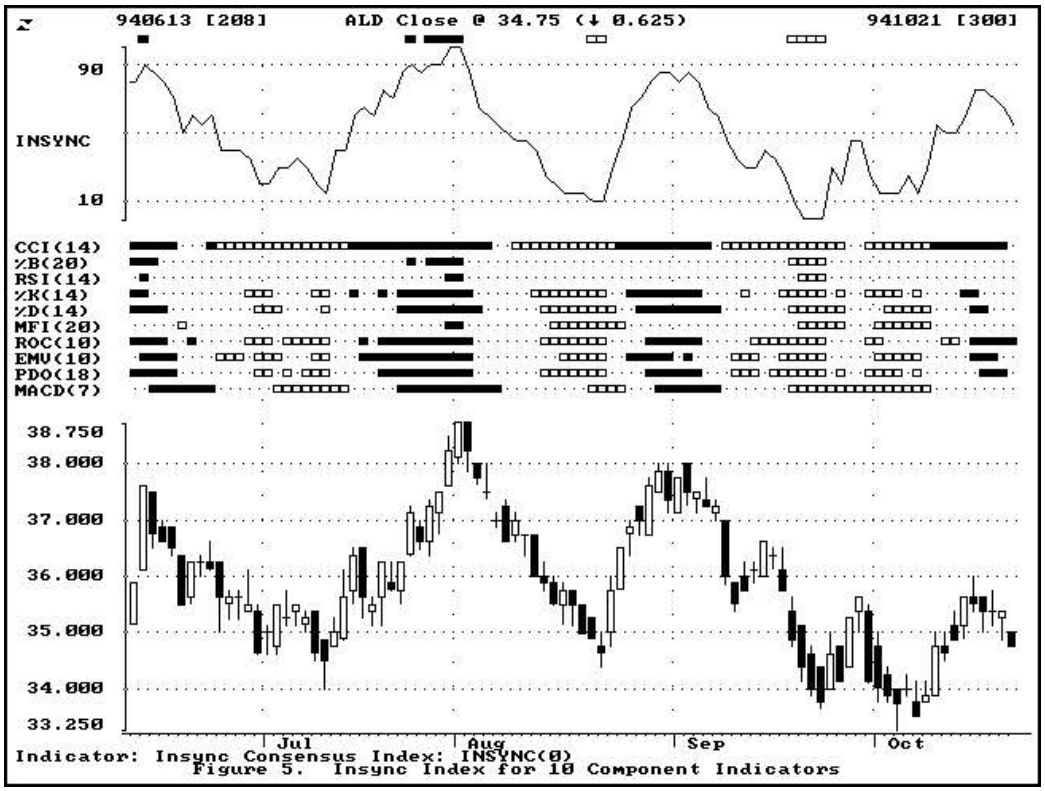


Figure 5. Insync Index for 10 Component Indicators

FIGURE 5: INSYNC INDEX FOR COMPONENT INDICATORS. *The same data is shown here as in Figure 3, plus the Insync index plotted at the top of the chart.*

Nothing could be simpler. No neural networks. No artificial intelligence. Just simple arithmetic! And it's easy to check visually. For 10 indicators, each presignal is worth five percentage points (remember that on this scale, a value of 50 is neutral). To calculate the value at any point, take the number of presells minus prebuys, multiply by 5 and add 50.

Note the two threshold lines drawn at values of 10 and 90 on the Insync plot shown in Figure 5. Testing has shown that these values are close to optimum for producing near-term signals. These values translate to a percentage requirement of 80% for both buy and sell. In this example, eight out of the 10 indicators must be in sync and none out of sync. When 80% of the indicators are in sync, the appropriate presignal sequence is shown above the consensus plot, again using open and solid boxes. Changing the thresholds to values corresponding to 90% and 100% produce intermediate- to long-term signals.

HOW IT WORKS

The best way of demonstrating how well the consensus indicator works is to compare it with the performance of its own component indicators. To do this, trades were simulated for all the component indicators and the consensus indicator on several sets of data. The trading was conducted only on the long side of the market (buy to open and sell to close). No short sales were simulated. The results of these simulations are presented in Figures 6, 7 and 8 for trades using the Dow Jones 30, the Standard & Poor's 100, and 39 continuous futures contracts.

Figures 6, 7 and 8 show the Insync consensus indicator and the 10 component indicators ranked in order of their performance on an average gain per trade basis. The performance of the Insync index is shown for three different pairs of threshold settings: 10 and 90, five and 95, and zero and 100. These values translate to 80%, 90% and 100% for the required percentage of indicators to be in sync.

INDICATOR PERFORMANCE (DJ 30, AVERAGE % GAIN)

930113 to 941021 Periods: 450 30 Files: C:\DJ30\

Indicator	Buy Line	Sell Line	Gainers	%Gain	Losers	%Loss	Net Gain %
INSYNC	0	100	15	73.60	4	-6.11	63.78
INSYNC	5	95	15	62.07	6	-14.47	45.54
INSYNC	10	90	20	58.23	8	-23.65	36.59
MFI(20)	40	60	21	38.98	6	-11.81	25.95
RSI(14)	35	65	18	37.67	10	-20.35	17.08
%B(20)	5	95	21	25.51	9	-12.06	14.37
MACD(7)	10	10	17	28.29	12	-16.97	10.20
%K(14)	20	80	20	11.80	10	-7.46	6.33
CCI(14)	-100	100	18	10.32	12	-5.89	4.52
EMV(10)	10	10	19	9.07	11	-8.57	2.90
PDO(18)	10	10	18	10.64	12	-10.00	2.71
ROC(10)	10	10	17	6.19	13	-7.96	-0.13
%D(14)	20	80	16	9.50	14	-15.28	-3.99

FIGURE 6: *Here are the results of simulations presented for trades using the Dow Jones 30. The Insync is shown and the component indicators ranked in order of their performance on an average gain per trade basis.*

The trading strategy for the Insync consensus indicator is similar to that used by other threshold crossing indicators (the relative strength index, %K, %D and so on). A sell signal is issued when the indicator rises above the upper threshold and then crosses it going down. Conversely, a buy signal is issued when the Insync index descends below the lower threshold and then crosses it in an upward direction. Relating this to the component indicators means that the required percentage of indicators must be in their presignal areas and ready to fire† and then one or more of them must fire to trigger the Insync signal.

INDICATOR PERFORMANCE (S&P100, AVERAGE %GAIN)

930113 to 941021 Periods: 450 100 Files: C:\SP100\

Indicator	Buy Line	Sell Line	Gainers	%Gain	Losers	%Loss	Net Gain%
INSYNC	5	95	61	249.98	20	-64.93	195.00
INSYNC	0	100	47	217.64	13	-42.70	176.73
MFI(20)	40	60	65	163.67	29	-58.15	101.26
INSYNC	10	90	61	167.76	34	-84.51	97.53
RSI(14)	35	65	63	134.80	32	-61.47	76.80
MACD(7)	10	10	63	104.85	37	-44.42	60.65
%B(20)	5	95	71	90.38	29	-28.71	60.56
%K(14)	20	80	74	52.64	26	-14.20	37.54
PDO(18)	10	10	65	60.08	35	-22.61	37.11
EMV(10)	10	10	74	53.33	26	-16.18	36.86
%D(14)	20	80	66	61.97	34	-33.27	28.83
ROC(10)	10	10	62	44.95	38	-20.84	24.26
CCI(14)	-100	100	53	37.86	36	-21.39	17.87

FIGURE 7: *Here are the results of simulations presented for trades using the Standard & Poor's 100. The Insync is shown and the component indicators ranked in order of their performance on an average gain per trade basis.*

The simulated trading results presented in Figures 6, 7 and 8 cover 450 days of trading using the indicated buy lines and sell lines (thresholds or trailing moving averages) for each indicator. The tabulated data include the number of tickers that showed gains and the total average gain per trade (%) for those tickers. Similar data is also tabulated for losses. The basis for ranking is the net difference (net gain %), not including the best gain and worst loss. The importance of the results is in each indicator's relative position, not the absolute value achieved by each indicator.

INDICATOR PERFORMANCE (FUTURES, AVERAGE % GAIN)

930114 to 941021 Periods: 450 39 Files: C:\FUTURES\

Indicator	Buy Line	Sell Line	Gainers	%Gain	Losers	%Loss	Net Gain%
INSYNC	5	95	26	103.02	5	-15.35	79.28
INSYNC	0	100	17	99.42	3	-2.56	74.54
INSYNC	10	90	26	64.33	8	-13.35	44.69
RSI(14)	35	65	20	44.19	12	-18.41	24.98
MFI(20)	40	60	20	39.71	11	-16.96	22.20
ROC(10)	10	10	25	17.42	13	-5.90	11.24
MACD(7)	10	10	22	24.65	14	-14.43	10.84
%D(14)	20	80	23	17.72	13	-10.00	9.46
CCI(14)	-100	100	16	20.84	15	-8.97	8.47
EMV(10)	10	10	19	17.90	20	-9.07	7.70
PDO(18)	10	10	23	15.37	15	-8.46	7.56
%K(14)	20	80	20	13.30	19	-8.91	2.74
%B(20)	5	95	17	20.19	19	-17.04	0.75

Rankings based on total net gain of all tickers minus best and worst gains.

FIGURE 8: *Here are the results simulations presented for trades using continous futures contracts. The Insync is shown and the component indicators ranked in order of their performance on an average trade per gain basis.*

Figures 6, 7 and 8 results clearly show that the Insync index almost always outperforms its component indicators, whose performances vary. All three figures show that increasing the percentage requirement results in fewer signals, as would be expected, but it also produces higher net gains in most cases. Total gainers and losers do not always add up to the total tickers. For some tickers, no signals were generated for that particular indicator. This is particularly evident when the Insync thresholds are set at zero and 100, requiring all component indicators to be in sync. It is also exhibited by RSI and money flow index (MFI), the values of which do not generally have wide excursions.

As a matter of interest, Bollinger's oscillator (%B)† is the most common trigger indicator.

CONCLUSION

To summarize, the Insync index provides a means of representing, and even enhancing, the output of a group of component indicators. It can be used to scan large (or small) databases extremely quickly.

Norm North is president of North Systems (formerly N-Squared Computing) and has been developing technical analysis software since 1981.

REFERENCES AND RESOURCES

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