Enhanced Indicator for Tradestation Charts

designed and programmed by Jim Cooper w2jc

Enhanced Composite PPO/ADX Indicator

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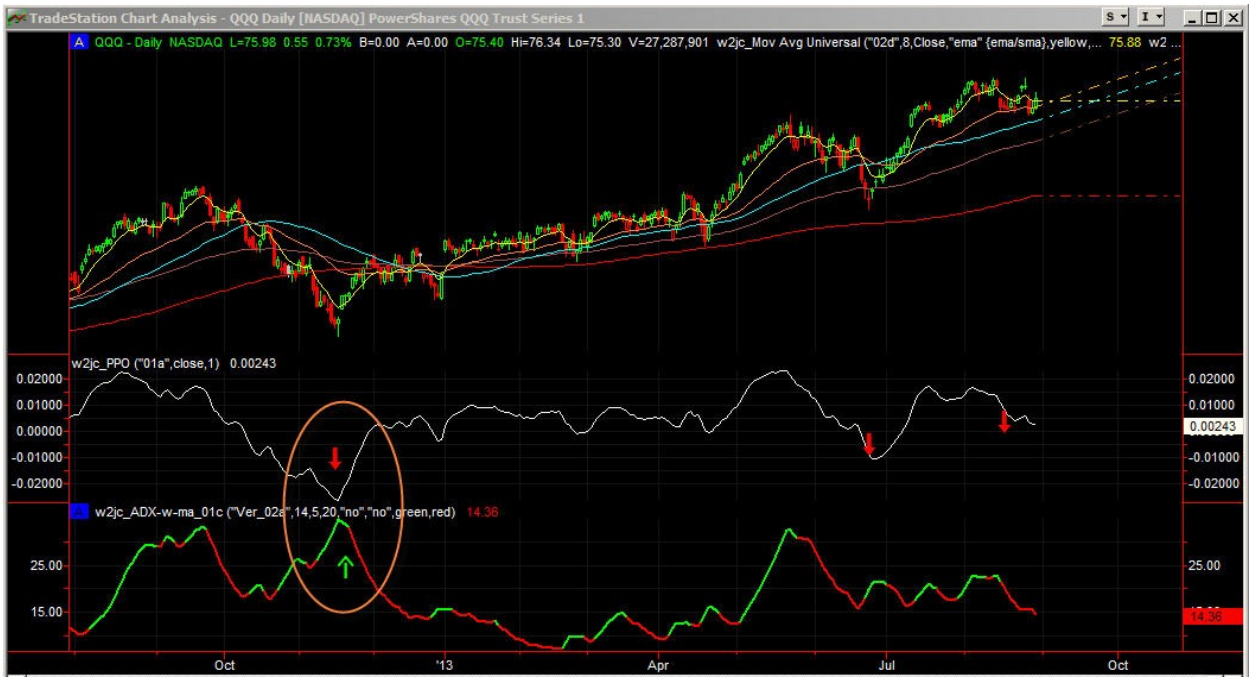
Composite PPO/ADX Indicator

Introduction



Original concept presented on the web, showing pattern of PPO relative to ADX.

Original idea

The original concept for interpreting this pattern came to me via a webinar that was presented at the end of August, 2013 by a guest in Steve Bigalow's CandlestickForum.com

It sounded like an interesting pattern to spot trend reversals, especially bottoms -- so I looked into Tradestation and the available indicators, knowing the ADX was there and hoping to find PPO. Alas, there seems to be no Tradestation implementation of the Percentage Price Oscillator.

Some research turned up the formula used for PPO, so I proceeded to write some code so I could have the indicator displayed and "play with it" for a while. Whenever I learn of a new indicator, I want to put it on my charts and play with it, to get a feel for how it works and how often it doesn't work, etc. (You can read about the PPO at http://www.investopedia.com/terms/p/ppo.asp).

The chart above shows very clearly the pattern that was pointed out, and you can see that it happened right at the bottom of the price chart. But this chart is a 'textbook example" and the "squeeze" of the two indicators (PPO and ADX) are not always that pronounced.

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Enhancement ideas

If the PPO were inverted, so that the valley in the chart above was instead a peak, then the peak of the two indicators would coincide and probably would be much easier to spot visually.

I also noted that when the original PPO (above) peaked at the same time the ADX peaked, there was often a "topping" reversal - which is also nice to find!

And since I was writing the code, why not have both indicators included in one package so that they could be loaded in the same sub-graph area with one "Insert Analysis Technique" action ...

Development stages

After writing the code to show PPO on Tradestation charts, and checking it to be sure it was displaying correctly, I put it on the chart in sub-graph 2 and then inserted the ADX (without the ± DI lines) in the sub-graph 3 area - as shown in the chart above. That was the basic part! After that, the following enhancements have been added:

- enhanced the alert messages for ADX (as described later in the Alerts section)
- massaged the ticker symbol to add a space between each letter, which makes the audio alerts much easier to understand - since the Windows text-to-speech module tries to pronounce many of the tickers as words!
- added a fast moving average to PPO so the crossover could be used to show direction reversal.
- added an 'offset' input value so that PPO can be adjusted to match the ADX position.
- added a 'multiplier' so that PPO could be expanded to match the ADX plot for easy comparison.
- added input 'switches' to turn off and on the PPO and ADX plots.
- added a second, inverted PPO plot (will be explained later in this document).
- added an input switch to allow plotting either one or both PPO lines.
- added a 'dashboard' for "PPO status" with green dot if PPO is rising, red dot if PPO is falling.
- added a 'dashboard' for "ADX status" with green dot if PPO is rising, red dot if PPO is falling.
- added a 'dashboard' for "Trade status" which combined PPO and ADX status for a long/short flag.
- added input switches to turn the dashboards on and off.
- provided user selection of four colors for +PPO and -PPO (2 each) [ver. 02h]

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Special Features

Both a *normal* and an *inverted PPO* are provided in this indicator. When the inverted PPO peaks with an ADX peak, a bullish reversal is expected so the PPO color changes from magenta to cyan. When the normal PPO peaks along with an ADX peak, then a bearish reversal is expected, so the PPO color changes from cyan to magenta. (An input option called "**show_one_PPO**" is provided which will show only the normal PPO if set to '**yes**'; the second, inverted, PPO plot will not be shown when this switch is set to 'yes'). It is strongly suggested that the -PPO be set to a dotted line and +PPO be a solid line.

The input value **PPO_ma** provides control of the moving average of PPO, used to determine the change between 'rising' and 'falling.' If there are short lengths of magenta in a rising cyan PPO line, this value can be increased slightly to eliminate those short 'glitches.' Keep in mind that increasing **PPO_ma** will delay the detection of trend changes; you want to use the lowest value that still has no 'false reversals' of the PPO lines.

A **PPOmult** input value allows the user to amplify the vertical size of the PPO plot lines so they can be more easily compared with the ADX line. (Common PPO values are 0.02, so they would not show on a chart scaled for 20 or 60 for the ADX).

A **PPOoffset** input value allows the user to move the PPO lines vertically so they can be more easily compared with the ADX peaks.

An option to **show_PPO_status** is provided FOR ADVANCED USERS, with "**yes**" or "**no**" option; this indicator provides a horizontal indicator at the zero level, with color change dots to show if PPO is rising or falling - to better spot reversal points. (This option should be used only by advanced users, as it can be confusing until properly understood.)

An option to **show_ADX_status** is provided FOR ADVANCED USERS, with "**yes**" or "**no**" option; this indicator provides horizontal dots at the zero level, with color change to show if ADX is 'trending' or 'drifting' - to better spot reversal points. (This option should be used only by advanced users, as it can be confusing until properly understood.) An alert provides notice of ADX reversals and trend status.

An option to **show_trade_status** is provided by a horizontal row of **+** symbols which can be either green (long), red (short) or black (stay out). This is controlled by logic involving both the PPO and ADX status. It should be used only as a guideline, not as a single trigger.

This indicator combines the two PPO indicators and the ADX indicator (without the ± DI lines) into one package so it can be installed as a complete "reversal indicator."

Alerts

Four alerts are provided with the ADX indicator, to alert the user to the current 'trend status' -- remember, a rising ADX does not indicate and 'up trend' ... it indicates a trend in either direction that is increasing in strength.

The four ADX trend indications that cause an alert are --

- trend is trending
- trend is drifting
- trend is starting
- trend is over

A fast moving average of the ADX is used to decide if the ADX indicator is moving up or down; it is also used as a crossover trigger to indicate the start and end of a trend condition.

The trend is considered "**trending**" if the value of the ADX line two bars back was above the moving average AND the current value of the ADX is above the current value of the moving average.

The trend is considered "**drifting**" if the value of the ADX line two bars back was below the moving average AND the current value of the ADX line is below the current value of the moving average.

The trend is considered "**starting**" when the value of the ADX line two bars back was below the moving average AND the current value of the ADX line is above the current value of the moving average.

The trend is considered "**over**" when the value of the ADX line two bars back was above the moving average AND the current value of the ADX line is below the current value of the moving average.

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Alert Messages

The alerts are in the format shown below:

Ticker spelled out + "A D X trend is" + { "starting" / "trending" / "over" / "drifting" } + Ticker spelled out again

When audio alerts are used, this format first tells you which chart is being alerted,
then tells you the alert condition, and then repeats the ticker in case you missed it at the start.

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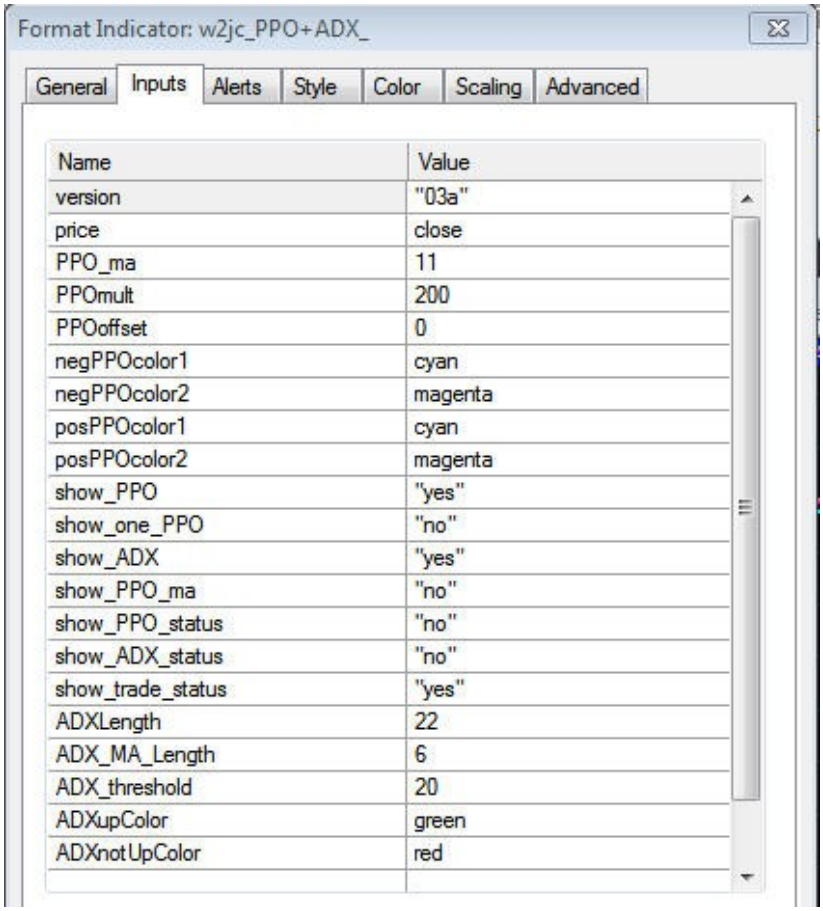
Formatting and Setup

User Inputs



Version Although the Version appears as a User Input, it should only be changed when the indicator is updated while already installed in a chart; it is here so that the Version will appear on the top line of the chart and the version in use can be easily determined.

Price Default is **Close**. Any value on the bar (H, L, O, C) may be used if you have a special need to do so, but almost everyone uses Close for averages.

PPO_ma Default is 11. See page 16 for info about this setting.

PPOmult Default is 200. See page 17 for discussion of this setting.

PPOoffset Default is 0. See page 17 for discussion of this setting.

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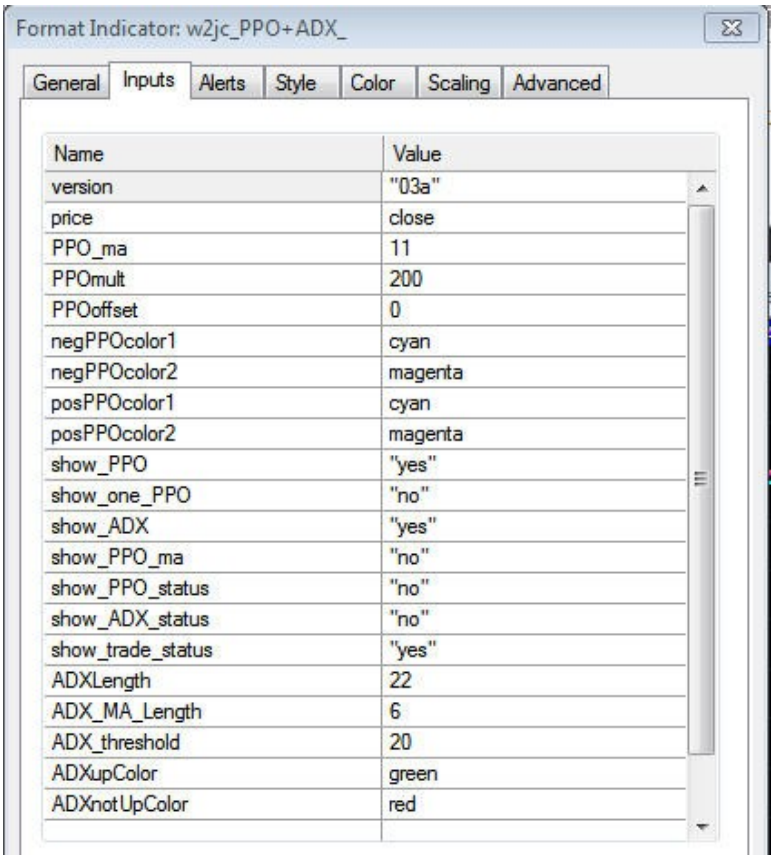

negPPOcolor1 Sets color for - PPO line when it is falling; default is cyan.

negPPOcolor2 Sets color for - PPO line when it is rising; default is magenta.

posPPOcolor1 Sets color for + PPO line when it is rising; default is cyan.

posPPOcolor2 Sets color for + PPO line when it is falling; default is magenta.

show_PPO Default is "yes" - with the double-quote marks.
Use "no" to not display any PPO lines.

show_one_PPO Default is "no" - with the double-quote marks. See page 18.

show_ADX Default is "yes" - with the double-quote marks. Else use "no" ...

show_PPO_ma Default is "no" - with the double-quote marks. See page 16 for info.

show_PPO_status Default is "no" - with the double-quote marks. See page 5.

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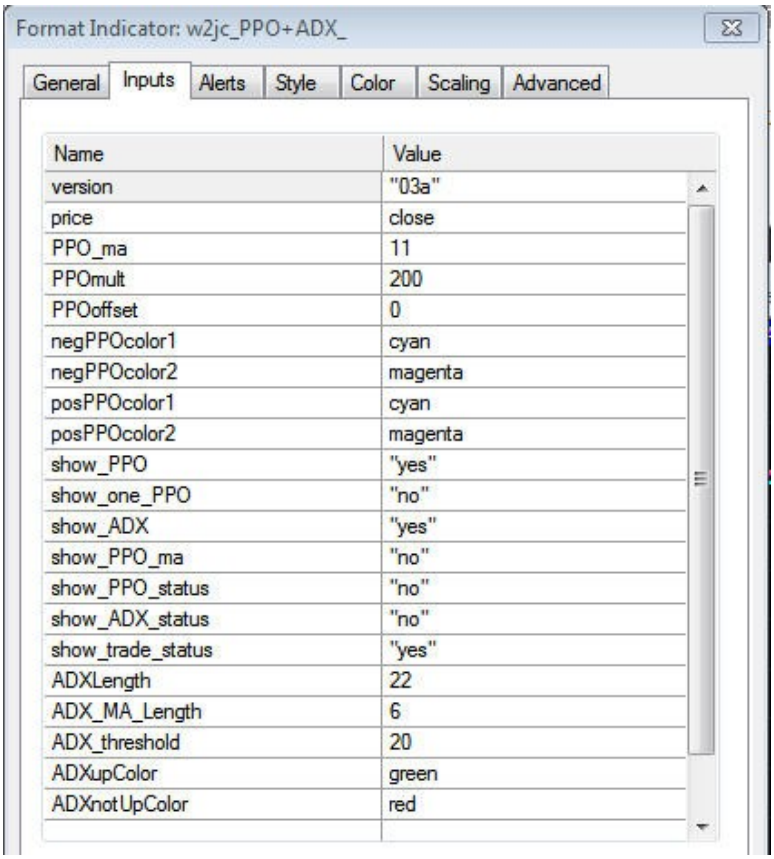

show_ADX_status Default is "no" - with the double-quote marks. See page 5.

show_trade_status Default is "yes" - with the double-quote marks. See page 5.

ADXLength Default is 22. See page 15.

ADX_MA_Length Default is 6. See page 15.

ADX_threshold Default is 20. See page 15.

ADXupColor Default is green - no quote marks. Or RGB(nRed, nGreen, nBlue)

ADXnotUpColor Default is red - no quote marks. Or RGB(nRed, nGreen, nBlue)

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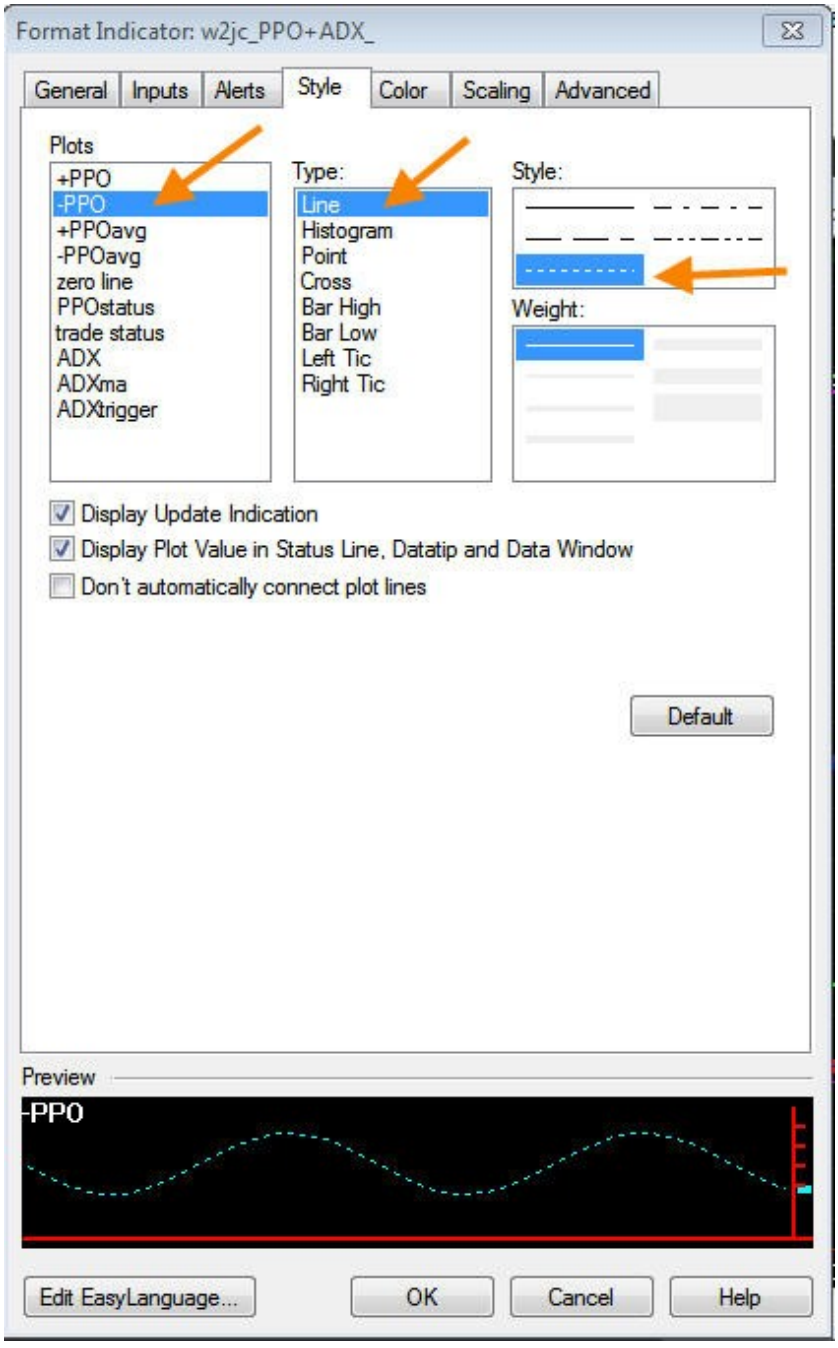
Format STYLEs

Most of the Style settings will default to the correct values. The style of plotted lines cannot be set in the program code however, so it is sometimes necessary to manually change those settings -- or you may prefer a different style for one or more of the lines, especially the "dashboard" status settings.



One specific Style setting you should set is for the **-PPO** plot, which should be set to Dotted. This is explained on the following page.

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There are times when the **+PPO** and **-PPO** lines come close together, maybe even touching, after which they diverge. In some cases, if both lines were solid it would be difficult to tell if they actually crossed each other or if they just came close and then spread apart again. See below:

In the example above, if the **-PPO** line was solid like the **+PPO** it would look very much like the **-PPO** had crossed and was declining while the **+PPO** line was continuing to rise (showing a continuation of the current trend).

With the **-PPO** line dotted, it is clear in the above example that the two PPO lines converged, just barely touched and "bounced" -- a very different condition than if they had crossed each other.

The **Composite PPO+ADX Indicator** as distributed is set to default with the **-PPO** line being dotted; however, this is not 'locked in' and might change during usage. Thus this description and warning to check this setting.

Note: beginning with version 02h the user is able to set different colors for rising and falling on both the +PPO and -PPO lines -- therefore, it is now possible to use different colors for the two lines and thus one can be distinguished from the other even if they are solid lines. (Some users found the thin dotted line hard to see, and Tradestation does not permit thickness adjustment on plotted lines that are not solid). See page **Error! Bookmark not defined.**.

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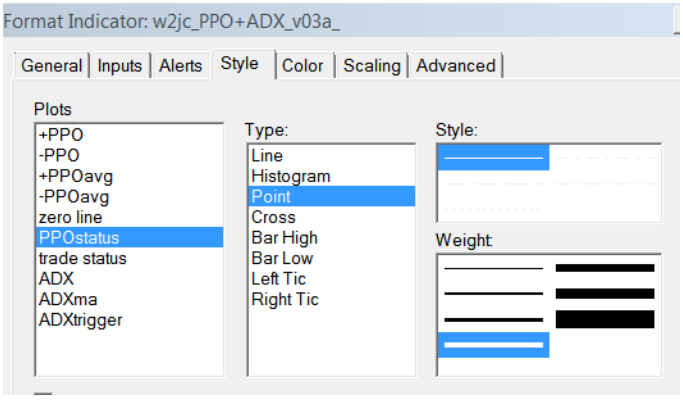
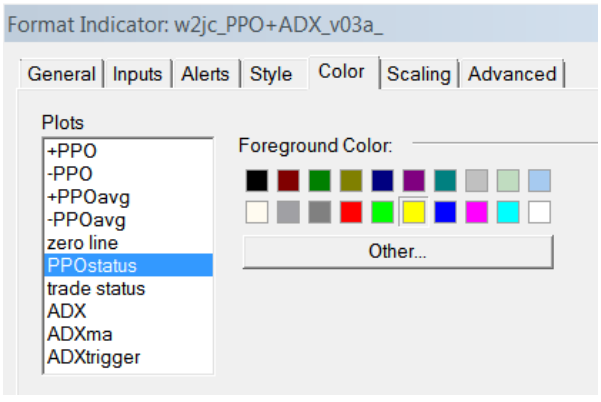
Default settings for Style and Color

The table below documents the standard default settings for this indicator package. (This is important in case settings get changed during normal use and you desire to return to the default setup).

Name	Style	Type	Thickness +	Color *
+PPO	Line	1 __	1	16 [yellow]
- PPO	Line	3	1	19 [cyan]
+PPOavg	Line	1 __	1	16 [yellow]
- PPOavg	Line	1 __	1	19 [cyan]
Zero Line	Line	1 __	1	17 [dkblue]
PPO Status	Point	1 __	4	16 [yellow]
Trade Status	Point	1 __	6	16 [yellow]
ADX	Line	1 __	2	14 [red]
ADXma	Line	3	1	10 [bluish]
ADXtrigger	Point	1 __	4	16 [yellow]
			+ Numbers are counted down left column, then down right column.	
			* Numbers are counted left to right on top line, then left to right on lower line of color chart.	





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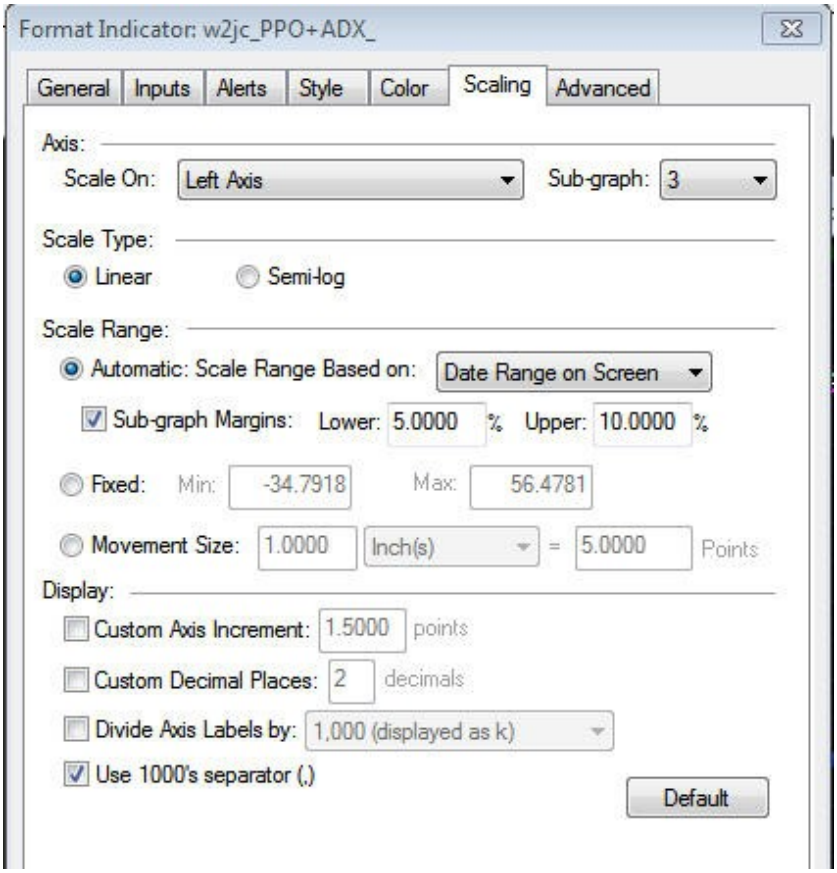
Format Scaling



The **Format: Scaling** tab allows the user to select where the Indicator will be installed.

The **Composite Indicator** should not be installed in the top Price area of your chart;
it should be installed in one of the sub-graph areas below the Price area -- otherwise, it will probably distort the vertical scaling of the Price chart.

Note:
If you really want to superimpose the **Composite Indicator** on the price chart, then you should use the **Scaling** tab and change the **Axis : Scale On:** setting to **Left Axis** and be sure the Price is shown only on the Right Axis.

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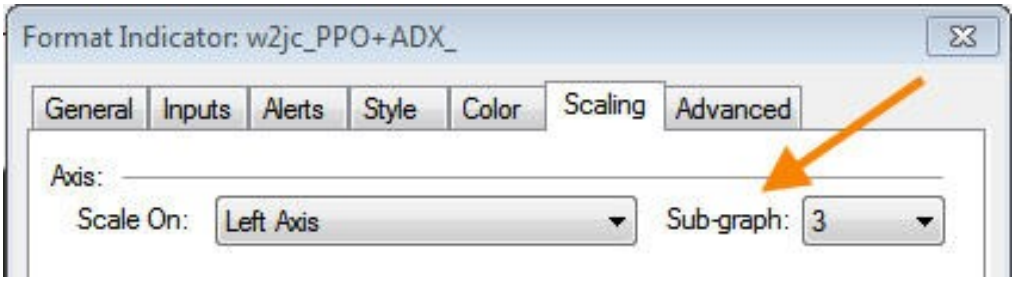
Using the Composite PPO+ADX Indicator

Using on charts

The Composite PPO+ADX indicator places all the relevant indicator plots in one sub-graph, which can be chosen when the indicator is put on the chart by using the Scaling tab of the Format Indicator menu window.



Inputs

When the "**Format Indicator**:" window appears, click on the "**Inputs**" tab first. Using the information in the User Inputs section (above), make the appropriate changes to the Input settings.

Some of the inputs provided are really intended for more advanced analysis of how the indicator is working, but they may at times be useful to any user.

The default value of each input parameter is shown in the previous section titled "Formatting and Setup." When learning to interpret this indicator, it is suggested that you leave the default settings.

ADX Settings

Because this indicator is based on someone else's implementation (different from this one) of the ADX and PPO, the value settings for ADX are set internally to match her choice of settings. Provision is made, however, for the user to change the basic parameter, **ADXLength**, if desired (not recommended).

The **show_ADX** input is a yes/no switch, and simply decides whether the ADX lines will be displayed or not. (There might be a time when the user wants only the PPO to show).

A dotted moving average line is shown along with the ADX, which helps to spot where the ADX direction reverses. This can be set with the **ADX_MA_Length** input setting, and should be adjusted so that small 'bumps' in the ADX line do not hit the moving average line.

Strength of trend with ADX is usually confirmed by using a threshold of 20; this value can be changed with the **ADX_threshold** input setting. (see also **show_ADX_status**, below).

As noted on page 5, an optional "ADX status" indicator is available for display with this indicator package. It consists of a horizontal line on which dots or + are shown with the color indicating whether there is a strong trend (good for trading) or a "drifting" condition (not good for trading) reported by ADX. This status line can be turned on and off with the **show_ADX_status** yes/no setting.

The color of the main ADX line changes depending on whether ADX is rising (trend is strengthening; default is green) or falling (trend is drifting; default is red). These colors can be changed by the user with the **ADXupColor** and **ADXnotUpColor** settings - use the standard 16 color names, or use the RGB(nn,nn,nn) format.

PPO Settings

Values for the PPO are set internally to match the values used by the original presenter and cannot be changed. The value of the fast moving average that is used to change the color of the PPO line(s) can be selected by the user. This setting can vary for different tickers and for different time frames - the criteria is to select the **PPO_ma** so that there are very few short changes (whipsaws) of the PPO line colors. This helps to avoid the "choppy" areas of charts. The default value is 11, but you might want to increase it to 16 or even 21 at times.

Normally, the moving average associated with the PPO line is not displayed. However, if for some reason the user wants to see it (sometimes it is easier to set its value when you can see how close it is coming to the PPO line, since the value of the moving average should be set so that small bumps in the PPO line do not cause the PPO line color to change back and forth a lot). To show the PPO moving average on the display, set the **show_PPO_ma** input to "yes" - with the double quote marks. Otherwise, set it to "no" with the double quote marks.

> **Note:**
> the longer the PPO moving average is (larger number), the more delay there will be in detecting the change in PPO direction. The needs to be balanced with having too much 'chop' or switching back and forth. As noted above, the best procedure is to temporarily show the PPO moving average lines, then adjust the value of the **PPO_ma** and then turn off the PPO moving average lines. Here is an example... in the first screen shot, the **PPO_ma** is set for 11 -- you can see the short cyan color on the PPO line during the 'chop' time.

When the **PPO_ma** setting is changed to 14 that color chop is removed --

Note: the red **+** row in the above example screens is the "trade status" indicator, which is described elsewhere in this document.

Because the numerical value of the PPO and the ADX can be very different in magnitude, there are two other user inputs that must be set depending on the ticker and time base being used -- to make the visual comparison of the two indicators (PPO and ADX) easier.

First, adjust the value of the **PPOmult** (multiplier) to a value where the two PPO lines are spread apart a 'nice' amount - with a few adjustments, you will get the feel for setting this value! (This value can range from 100 to 10,000 or more, depending on the actual value of PPO).

Second, adjust the value of the **PPOoffset** (vertical positioning) to a value such that the center of the two PPO lines matches the center of the ADX spread. This does not have to be exact; it is just a way to get the two sets of indicator lines superimposed so they can be more easily compared. An easy way to select the **PPOoffset** value is to look at the value of the ADX on the right vertical axis and use that as a guide to set the **PPOoffset** value.

Here is an example of using these two settings ... your chart might look like this when you first change to a new ticker. The green/red ADX is squashed together at the bottom, and the cyan/magenta PPO lines are squashed together and far away from the ADX lines --

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Below, the **PPOmult** has been increased substantially (to spread the PPO lines) and the **PPOoffset** has been reduced to center the PPO lines around 10 instead of 35.

Finally, there is an input option to show only one of the PPO lines (not the inverted one) since there was a user request for this feature. Set the **show_one_PPO** value to "yes" (with the double quotes) if you only want the single PPO line; otherwise it should be set to "no" (with the double quotes).

Comment:
You might ask "why can't the **PPOmult** and **PPOoffset** values be set automatically by the software?" They could, and there are a couple of ways it could be done (but I don't care for the results of either!). The current value of the ADX could be determined and the PPO offset value could be adjusted automatically to match it -- which would center the PPO lines about the current value of the ADX. However, this calculation would be repeated for each new bar and the plotted result would have the PPO lines wandering up and down across the chart, following the variation of the ADX!

The centering of the PPO with the ADX could be done once, when the chart is first opened. This would avoid the "wandering" problem. But as the ADX value changes, the PPO would not be centered after a while.

As for the PPO multiplier, I've found that this setting is closely related to personal preference. It also affects the spread of the ADX and its moving average. A couple of "try and look" settings gets the presentation to a suitable display; after doing it a few times, it's easy to pick values that will look nice.

Experience indicates that a good way to set up this indicator is to first observe the ADX value at the right edge, and whether the PPO lines are spread apart "enough" -- then go to Format Indicator and set the **PPOoffset** to match the ADX value. If the PPO lines were not spread apart enough, double the value of the **PPOmult** and view the lines again. Repeat and "refine" until you like them. Keep in mind that the more you spread the PPO lines, the more you will "squeeze" the ADX and its moving average together. Also, if -PPO does not show as dotted use Format: Style: -PPO = Line, dotted. See page 11.

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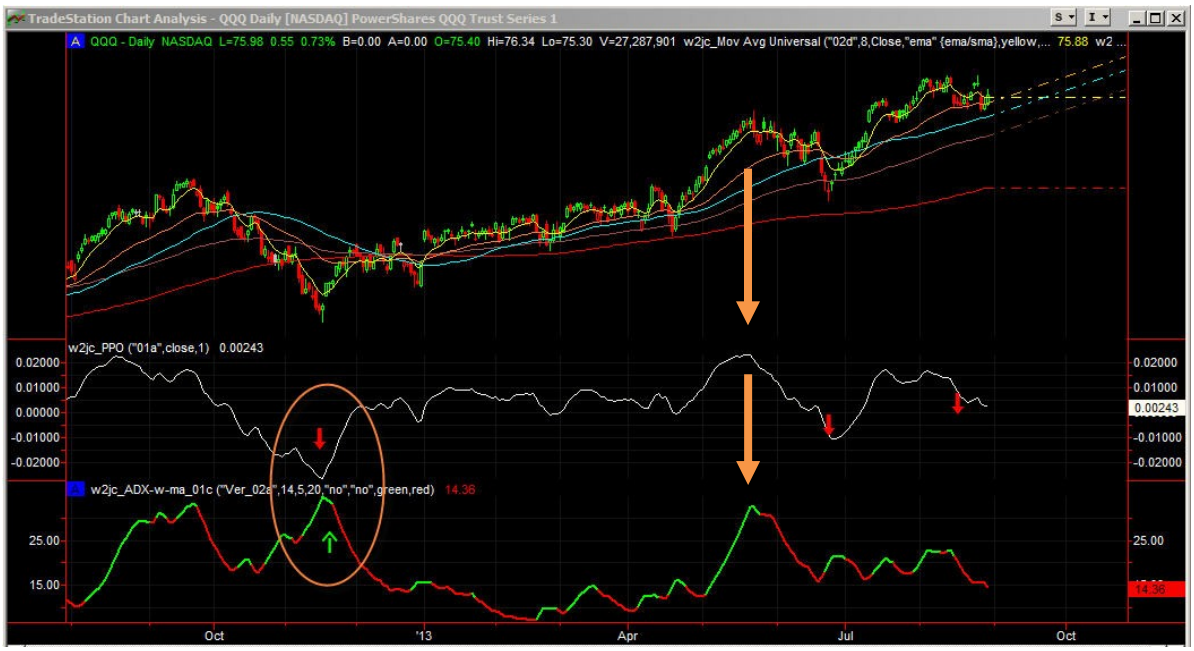
Interpreting the Composite PPO+ADX Indicator

Here's the fun part!

As noted in the Introduction section of this Guide, the original use of this concept has the PPO single line in one sub-graph area and the ADX line in an adjacent sub-graph area and the user visually notes where the two indicators move in opposite directions and come closest to each other -- this condition portends a change from bearish to bullish.

More vague, and harder to interpret, is when both the PPO and ADX form peaks at nearly the same time -- this suggests a change from bullish to bearish.



Notice that in both cases, the ADX is peaking.

If we superimpose the PPO on the ADX in the same sub-graph area, we can more easily spot the places where BOTH lines are peaking -- which, as noted below, is our signal for topping or bullish-to-bearish reversal. But that leaves the other alert condition as being when a peak on ADX and a valley on PPO coincide -- which is still hard to pick out visually.

But, if we add another PPO line and turn it upside down then it will be peaking when the first PPO was showing a valley! Thus, for the bottoming alert we can look for coincident peaks on the ADX and the inverted PPO. This is why the Enhanced PPO+ADX Composite indicator has two PPO lines.

Ah, but how do we tell which PPO line is inverted and which is not? They could be made different colors. Or... we could color them both the same, but change the color when we get the reversing alert -- which is what has been done for this composite indicator.

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Above is an example which shows ADX going from "drifting" to "trending" and PPO changing between bullish and bearish a few times.

The cyan/magenta color coding on the PPO lines is the same for both lines and it is the current color that is significant. Notice on the left that although the trend is drifting, there was a change from bearish to bullish (PPO lines changed from magenta to cyan), followed by a peak in both the PPO and ADX (although the ADX peak in this case is not very strong) -- when the **top** PPO line (see, we don't care whether it is the inverted or regular PPO, just the top one) peaks, the color will change to show the upcoming condition. A change of the PPO color from cyan to magenta warns of a top and a coming pullback. A change of the PPO color from magenta to cyan warns of a bottom and a coming bull run.

In summary, we now don't care which of the PPO is inverted and which is not - we are just looking for the top one to peak at the same time the ADX forms a peak. When this happens, we can anticipate a change in price direction.

Status Indicators

There are three optional "status indicators" available: ADX, PPO and Trade. The first two are normally not used, as the color coding of the base indicators convey the same information. Each status indicator can be turned on or off with an entry in the Format Indicator: Inputs table.

TRADE STATUS indicator

The "trade status indicator" is a horizontal line on which green or red dots (or **+** symbols) are shown to indicate times when a long (green) or short (red) position is suggested.

> **Green** is shown when the PPO line(s) turn cyan AND the ADX line is green (rising).
> This indicates a bullish bias and a strengthening trend.
>
> **Red** is shown when the PPO line(s) turn magenta AND the ADX line is green (rising).
> This indicates a bearish bias and a strengthening trend.

Alerts

If you want to have the advantage of the alerts built into this indicator, click the "**Alerts**" tab of the "**Format Indicator**:" window and then be sure there is a check mark in the "**Enable Alert**" box -- if not, left click once on the box and the check mark should appear.

Our suggestion is to select "**Alert once per bar (interval)**" -- however, you might prefer other options.

You can use "**Custom Settings**" if you have specific requirements for moving average alerts, or you can use the common "**Global Messaging Preferences**" which are used for all other alerts. Our recommended settings for the Global preferences are:

Audible - Voice (text to speech)
Visual - Pop-up window: 15 seconds

You may, of course, configure the alert preferences any way you prefer.

The conditions under which an alert is triggered are explained earlier in this guide.

Other Tabs

The other tabs of the "**Format Indicator**:" window can be left in their default settings, unless you have particular preferences.

Other Info

Setting non-basic colors

There are 16 "basic" colors that can be specified by name:

- black
- darkblue
- darkbrown
- darkcyan
- darkgray
- darkgreen
- darkmagenta
- darkred
- white
- blue
- yellow
- cyan
- lightgray
- green
- magenta
- red

To specify any other color in the Format Indicator: Inputs table, you must use the RGB format.

```
RGB(nRed, nGreen, nBlue)
```
Where each red, blue, and green color value can be an integer from 0-255.

Enhanced Indicator for Tradestation Charts

designed and programmed by Jim Cooper w2jc

Version Updates

If design or coding updates are issued and you install the new version in place of the older version with the same indicator name, the **Version ID** in the Format/Inputs table will not update (that's the way Tradestation handles indicator updates).

Therefore, if you have installed a newer version of this indicator you might want to manually change the version ID in the Input table -- this is optional, and since this particular indicator may be used on many charts, you might want to just leave it.

Any "Composite PPO+ADX" indicators that you add to charts after the update will automatically show the new version ID in the Input table.

Updates to this indicator will be emailed to those who have purchased the indicator in the past.

Please review and become familiar with the Tradestation procedure for installing .ELD indicator files.

Enhanced Indicator for Tradestation Charts

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Purchasing the Composite PPO+ADX Indicator

At the present time, this indicator is available only from the author. It is more of a hobby than a business - but I decided that since I had done the development work and many enhancements, others might want to benefit from my ideas and work.

If you have not obtained indicators from Jim Cooper in the past, you will need to furnish your **Tradestation Customer ID number** (this is NOT your account number, and it will not allow access to any of your Tradestation accounts or information). This is used so that you can use this indicator on any computer in the world, as long as you are logged into one of your Tradestation accounts associated with that Customer ID number.

To find your Customer ID number while logged into Tradestation, simply click the Help tab at the right end of the top row of the Tradestation window. Then click the "About Tradestation" selection at the bottom of the drop-down menu. A pop-up window will appear and just below the center you will see your "Customer Number" -- this is the number that will be needed with your order.

An order for the **w2jc_PPO+ADX_** indicator can be placed directly on our website at

http://ppo-adx.TSindicators.info

Questions can be sent to: indicators@JimCooper.org

Payment can be made via credit card by using PayPal.

Support, if needed, can be obtained using the same email address above -- or via Skype at "jim-w2jc" ...