



**Version 2.0**

# **User Manual**

(July 2019 Edition)

[www.PairTradeFinder.com](http://www.PairTradeFinder.com)

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[www.pairtradefinder.com](http://www.pairtradefinder.com)

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## 1 Introduction

### 1.1 Overview of PairTrade Finder® PRO

Welcome to the PairTrade Finder® PRO v2.0 ("PTF PRO") User Manual. This manual is designed to help you understand the concepts within our software and how to get the most out of it. We highly recommend you take the time to read this manual as it could dramatically change your trading. So grab a cup of coffee and enjoy learning our highly popular pair trading software.

At first glance PTF PRO may seem complex or confusing. However, after reading this user manual and playing around with the software for an hour or two, you will begin to realise its simplicity and the power it provides you to be able to create and trade your own pair trading system. As far as we are aware, there is no other retail pair trading software available that comes close to performing what PTF PRO does with such an easy-to-use user interface and experience.

PairTrade Finder® PRO has been developed by professional traders in tandem with qualified programmers and has been continually developed over ten years. PTF PRO is constantly updated and upgraded - that's our ongoing commitment to our subscribers. We encourage user feedback to develop our software and many user suggestions are implemented in upgrades.

PairTrade Finder® PRO is a stand-alone software program that runs on Windows XP, Windows Vista or Windows 10. In section 1.2 we give you detailed instructions on how to install PairTrade Finder® PRO on your computer free for 15 days. Getting PTF PRO installed and running is a simple process that should take you less than five minutes to implement.

#### **What PTF PRO Can Do for You**

PTF PRO is a highly customizable tool you can use to generate trading signals on over 1,000,000 tradeable instruments from around the world including stocks, options, futures, CFDs, commodities and forex. It is a truly global platform to help find unique trading opportunities at a click.

PTF PRO allows you to create your own groups categorized by industry, sector, country or whatever else you can think of for grouping securities. You can then backtest all instruments within those groups against each other to determine correlation, cointegration and for measuring the historical performance of PTF PRO's trading signals. You can then customize how these trading signals are generated and save the pairs with the best historical performance to My Watchlist. Once on My Watchlist, PTF PRO then acts as a 24/7 market radar and will watch over all pairs at once and generate real-time trading signals and other alerts as they arise.

#### **Ease of Execution of Signals**

After designing your own custom pair trading system, you can use the Trading Signals window to easily see new entry and exit signals on your saved pairs. These signals come in during market hours or any other time which you can specify. PTF PRO's signals can be sent to your email inbox so you don't need to be in front of the computer all day, and you can receive and trade these signals from your phone with the help of one of many free broker applications. What's more, if you integrate PTF PRO with Interactive Brokers Trader Workstation, any of these signals received previously can be resent at current market prices for semi-automatic, 1-click execution at the time of your choosing.



## **Analytical Powerhouse**

Most importantly, PTF PRO puts a powerful analytic suite at your disposal to perform additional analysis on the trading signals. Use ratio, correlation, RSI, volatility, standard deviation and our own custom “% from the mean” charts to filter for the best trades. With quick links to news items, earnings release dates, dividend dates, ability to chart two instruments and to easily compare fundamentals, PTF PRO gives you added layers of analysis to improve your trading performance.

## **Ongoing Commitment to Support**

PTF PRO is designed to be user-friendly and to quickly perform the millions of near-simultaneous calculations required to run an effective correlation and cointegration-based pair trading system. Our software is also supported by a team of professional programmers and traders that regularly update the software to stay current with market conditions and changes. Subscriber support is available 24/6 at [support@pairtradefinder.com](mailto:support@pairtradefinder.com) with a targeted 24-hour response time.

Please turn to section 1.2 for instructions on how to download a free 15-day trial of PTF PRO. If you wish to continue using our software after 15 days, you will need to [subscribe](#).

## 1.2 The Pair Trading Strategy

To get a further in-depth background on the history of pair trading, how it works, why it works, its historic profitability and the sign up for a 15-day free trial to PTF PRO, please join our FREE webinar here: [Trade Like a Hedge Fund: Harnessing the Power of Technology to Deliver Market Edge](#).

PairTrade Finder® PRO is built around the pair trading strategy. Pair trading involves buying one instrument and at the same time shorting another instrument. This approach leaves you market neutral, as you are not betting on the underlying direction of the market, rather you are betting on the relationship between two correlated and cointegrated instruments.

Pair trading, or statistical arbitrage as it's more commonly known in the investing world, is the most popular trading strategy amongst hedge funds. Hedge funds recognise and value the reduced risk and ability to produce returns in any market environment that the pair trading strategy delivers.

Pair trading has been around since the invention of markets. Jesse Livermore, probably one of the most famous traders of all time, used pair trading back in the late 1800s. He would find a strong stock then short what he called the "sister stock". Pair trading really took off with large investment banks and hedge funds in the 1980s with the help of computers for quantitative analysis.

Today, pair trading is still a relatively new concept amongst most online traders.

That novelty is quickly changing, however. More and more online traders are beginning to see the benefits of the pair trading strategy. The go-go days of 1999 where you could wake up and buy Yahoo!, go out for breakfast, come back and have made \$3k are gone. Markets are a lot more sophisticated now, and so too must be your trading strategy.

With pair trading, it doesn't matter which direction markets trend: up, down or sideways, you can still profit. Risk is greatly reduced as you are not subject to the large directional price shocks the market can often experience (you are, however, subject to event risk which needs to be mitigated through news analysis, date screening, diversification and position sizing). Because of the reduced market risk of the "hedged" pair trading strategy, many pair traders can safely use leverage to magnify portfolio size, something that is not a safe approach when betting on a one-way movement.

We urge you to take some time out of your day and go through this User Manual with PairTrade Finder® PRO open on your desk. The 60-120 minutes you invest in learning our proprietary software we believe will pay handsome dividends and could dramatically change your trading and your income.

You may find it easier to print this user manual and have it in your hand whilst learning our software. The user manual is designed to flow from one section to another, giving you an overview of the software and teaching you how to extract the most value from it.

## 1.3 Installing PairTrade Finder® PRO

Everyone is welcome to download a free 15-day trial of PTF PRO. This free trial has no feature limitations and you will receive the same support provided to our already large user base. We welcome you to test out our support response by sending an email to [support@pairtradefinder.com](mailto:support@pairtradefinder.com). Our aim is to answer 90% of all emails within 24 hours. If at any time you have trouble installing PTF PRO please email us and we will guide you through the process. We can even remotely connect to your computer and install the software for you, right in front of your eyes. We provide this service free of charge.

If you have already successfully downloaded PTF PRO, please skip this section.

PairTrade Finder® PRO is a Windows-based program and if you have purchased your computer within the last five years, you will have the hardware and software pre-requirements for installing our software - it does not require the latest specifications to run.

### **Installing PTF PRO is a simple one-step process.**

Please download PairTrade Finder® PRO v2.0 software from [here](#). You can follow the detailed instructions on the Download page, if necessary.

The current PTF PRO Installer will automatically install Microsoft SQL Server 2012 Express LocalDB on your machine before installing PTF PRO if it does not detect that you have it already installed. SQL is a database program and creates the database where the historical and intraday securities data used by PTF PRO will be stored. PTF PRO automatically updates data into SQL so once it has setup SQL, you will not need to do anything further for updating and storing data in PTF PRO.

Our installer will also ensure that you have the latest version of Microsoft Visual C++ 2015 x64, which is required for PTF PRO to perform correctly. If for any reason the PTF PRO Installer does not install Microsoft Visual C++ 2015 x64 correctly, you can download and install it manually [here](#).

**Troubleshooting on older versions of Windows:** If you experience any problems in installing PairTrade Finder® PRO on older versions of Windows, then please make sure you have the latest version of Microsoft .NET framework installed on your machine. This .NET framework can be installed manually [here](#).

PairTrade Finder® PRO installation is quick and straightforward. Upon completion you should see the PTF PRO icon on your desktop. Please read on to section 1.3 for instructions on starting PTF PRO for the first time.

Email [support@pairtradefinder.com](mailto:support@pairtradefinder.com) for help with any installation issues and the support team will provide assistance or remotely install the software.

Please note only one license per computer is allowed, each machine's IP address is recorded to prevent transfer to another machine. To use PTF PRO on more than one machine, you will need to purchase additional License Keys subscriptions. Please email us at [admin@pairtradefinder.com](mailto:admin@pairtradefinder.com) should you need to do so. If you wish to migrate your License Key because you have upgraded or replaced your computer, email us at [admin@pairtradefinder.com](mailto:admin@pairtradefinder.com) and we will arrange for the migration.

### **Using PTF PRO with your Mac and Parallels Hypervisor or Using PTF PRO on a Virtual Machine**

By default, PTF PRO License Keys come with activation on hypervisors and virtual machines prohibited. Many users, however, run PTF PRO on Mac using the Parallels hypervisor ([www.parallels.com](http://www.parallels.com)) and many subscribers like to put PTF PRO on a standalone virtual machine instance to run 24/7. In either of these

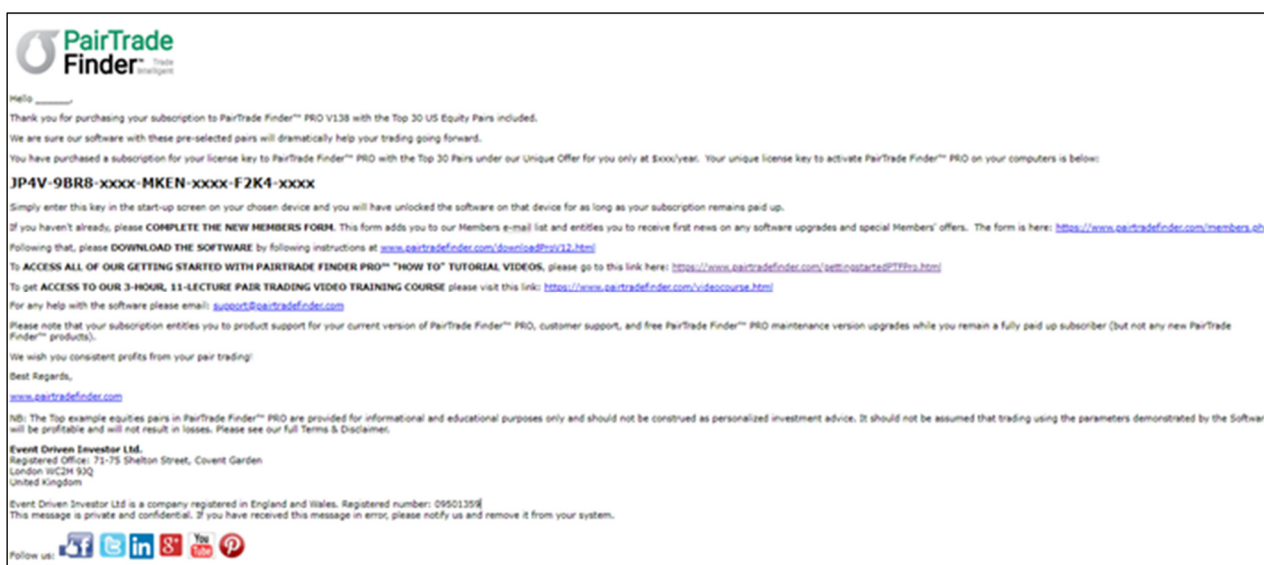
cases send us an email at [support@pairtraderfinder.com](mailto:support@pairtraderfinder.com) and we can enable your License Key for hypervisor and virtual machine activation by switching it to a “floating mode” of authentication.

## 1.4 Starting PairTrade Finder<sup>®</sup> PRO

Please note much of the information contained in this User Manual is also available in video tutorial format. These Video Tutorials on Getting Started with PTF PRO can be [found here](#).

Before you access the Download page outlined in 1.2 above, and after you have subscribed for our 15-day free trial (you can do so [here](#)), you will be sent a Welcome email with your License Key. Look for that email in your Inbox or spam folder (and add [admin@pairtradefinder.com](mailto:admin@pairtradefinder.com) and [support@pairtradefinder.com](mailto:support@pairtradefinder.com) to your Contacts to ensure you can receive email support from us).

The Welcome email should look more-or-less as follows:



In it you will find your PairTrade Finder<sup>®</sup> PRO License Key, and instructions as to how to get started with the software, our tutorials and the video training course. Please also ensure you fill out our Members form to ensure you get invited to our special offers and free PTF PRO upgrades. Here are the links:

### Complete the New Members Form.

The form is here: <https://www.pairtradefinder.com/members.php>

### Download the Software

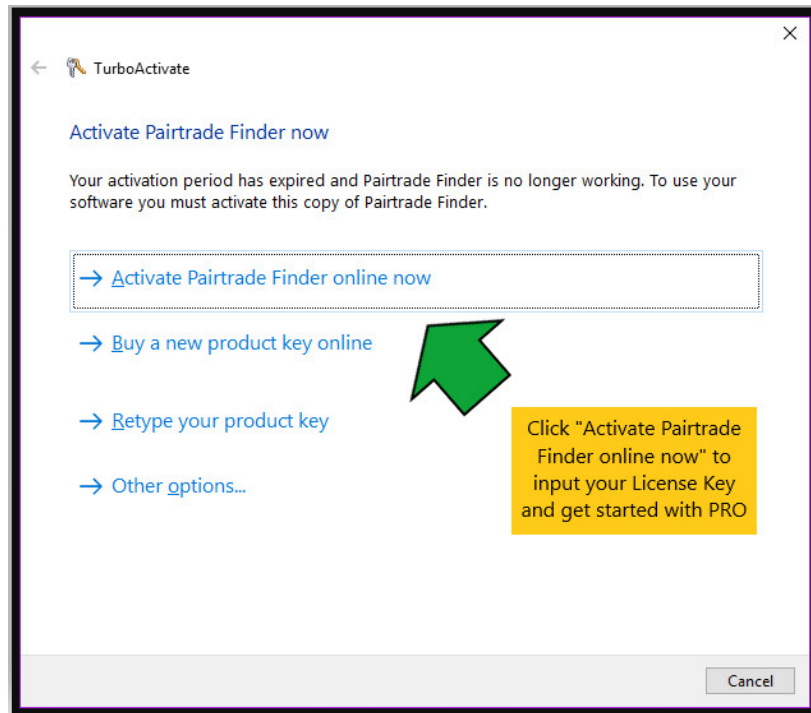
By following instructions at [www.pairtradefinder.com/downloadProV12.html](http://www.pairtradefinder.com/downloadProV12.html)

**Access All of Our Getting Started with Pairtrade Finder Pro<sup>®</sup> "How To" Tutorial Videos**, please go to this link here: <https://www.pairtradefinder.com/gettingstartedPTFPro.html>

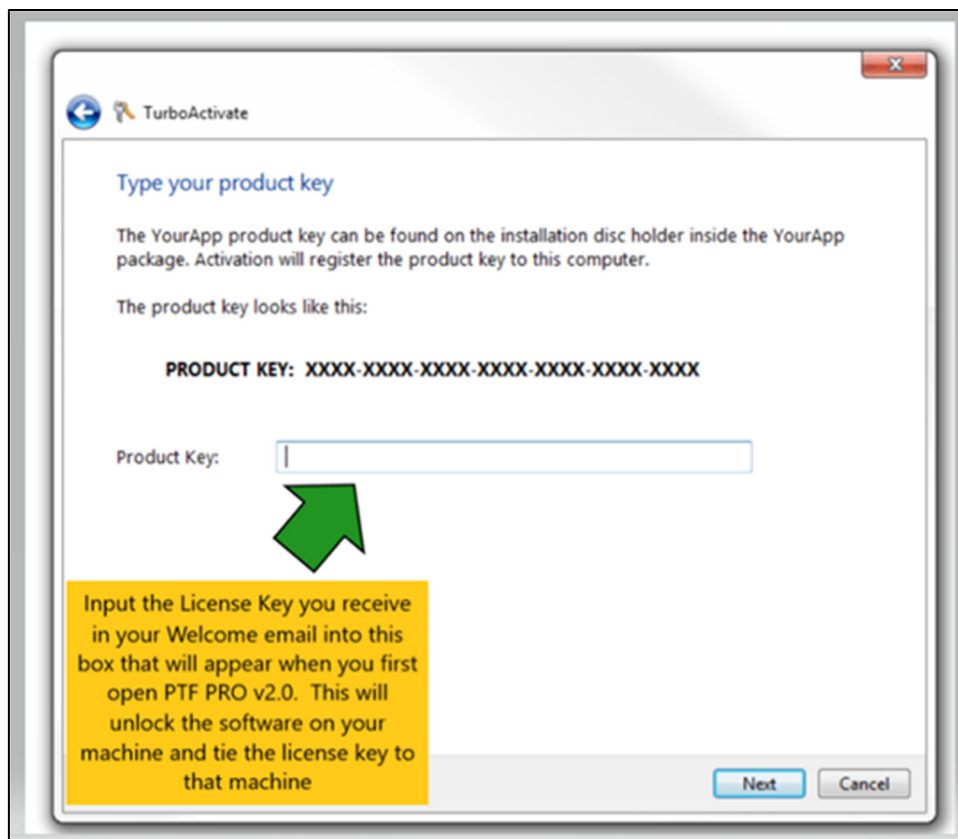
### Access to Our 3-Hour, 11-Lecture Pair Trading Video Training Course

Please visit this link: <https://www.pairtradefinder.com/videocourse.html>

Open PairTrade Finder<sup>®</sup> PRO from your desktop. You will see the below screen once open:

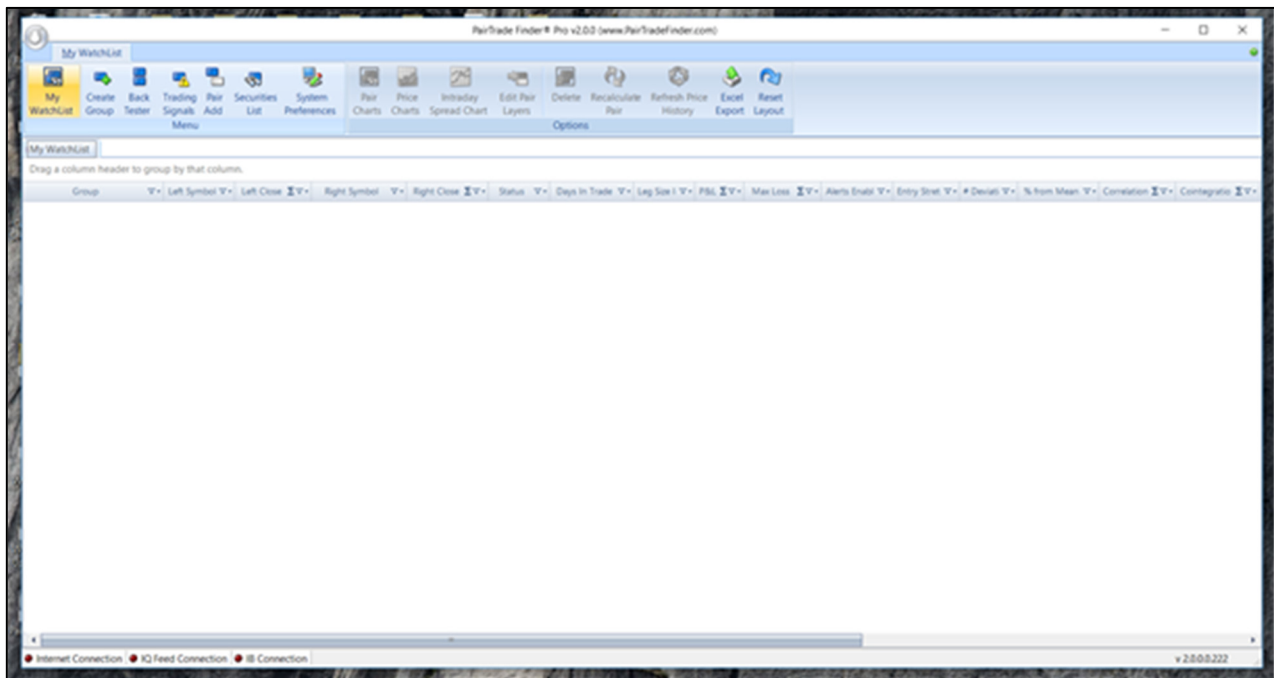


Once you click Activate you will see the following screen:



Please type in your correct License Key and click next. The license key will now be locked to the device on which it is activated.

Next you will see the below screen:

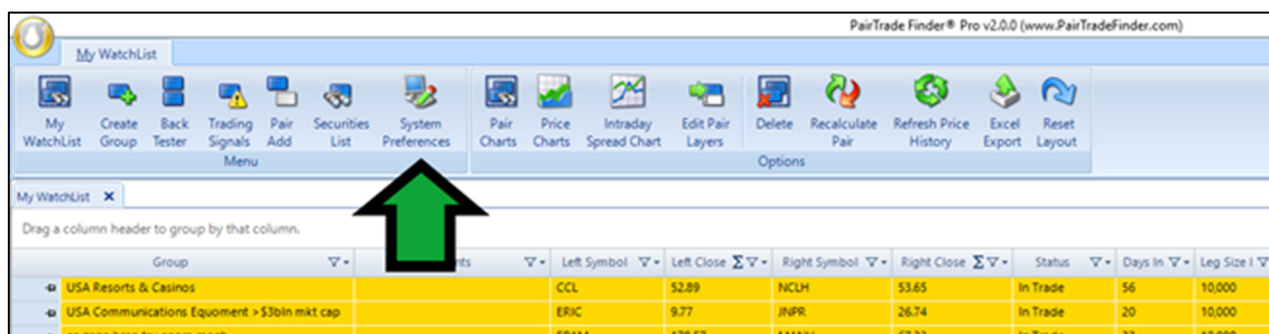


Please read onto section 2.1 for instructions on how to input your first group of stocks into the program to find high-probability pairs to trade.

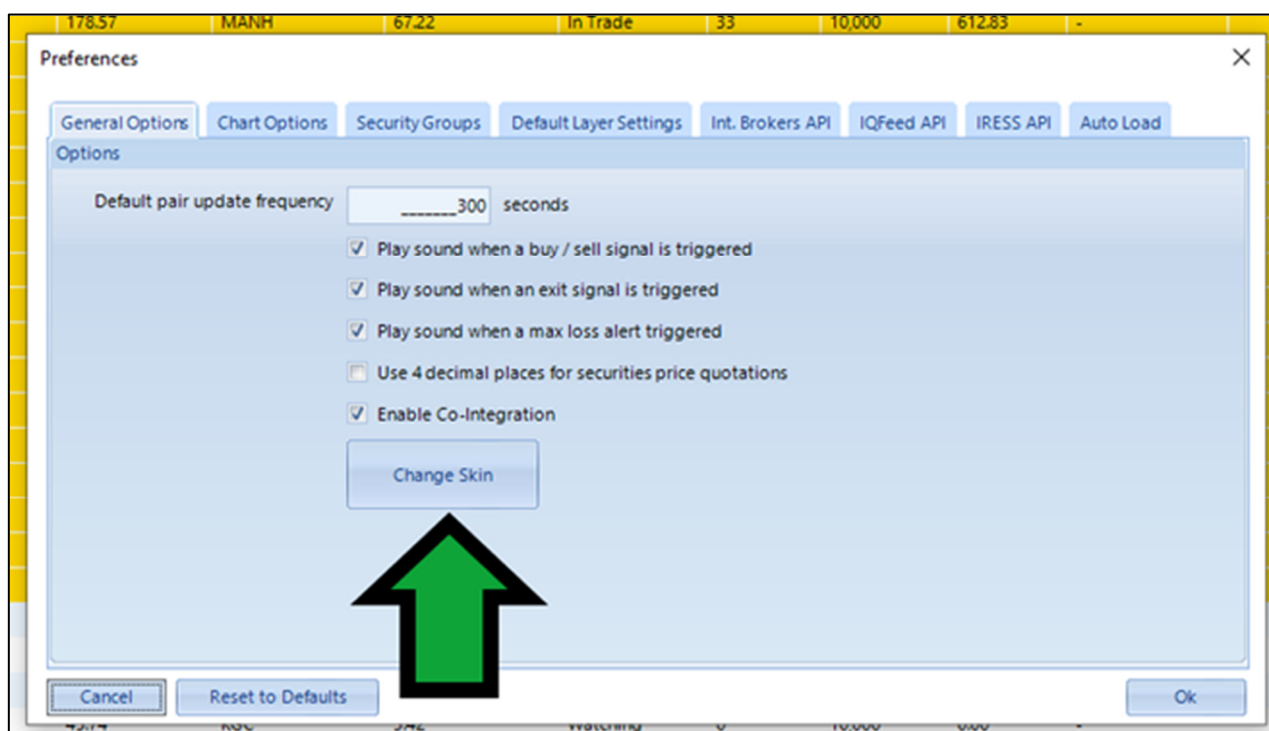
## 1.5 Changing Skins/Screen Colours

In this example we will show you how to choose one of nine different skins for PTF PRO, so that you can choose a setting that goes best with your use case and preferences.

Go to System Preferences on the upper toolbar:

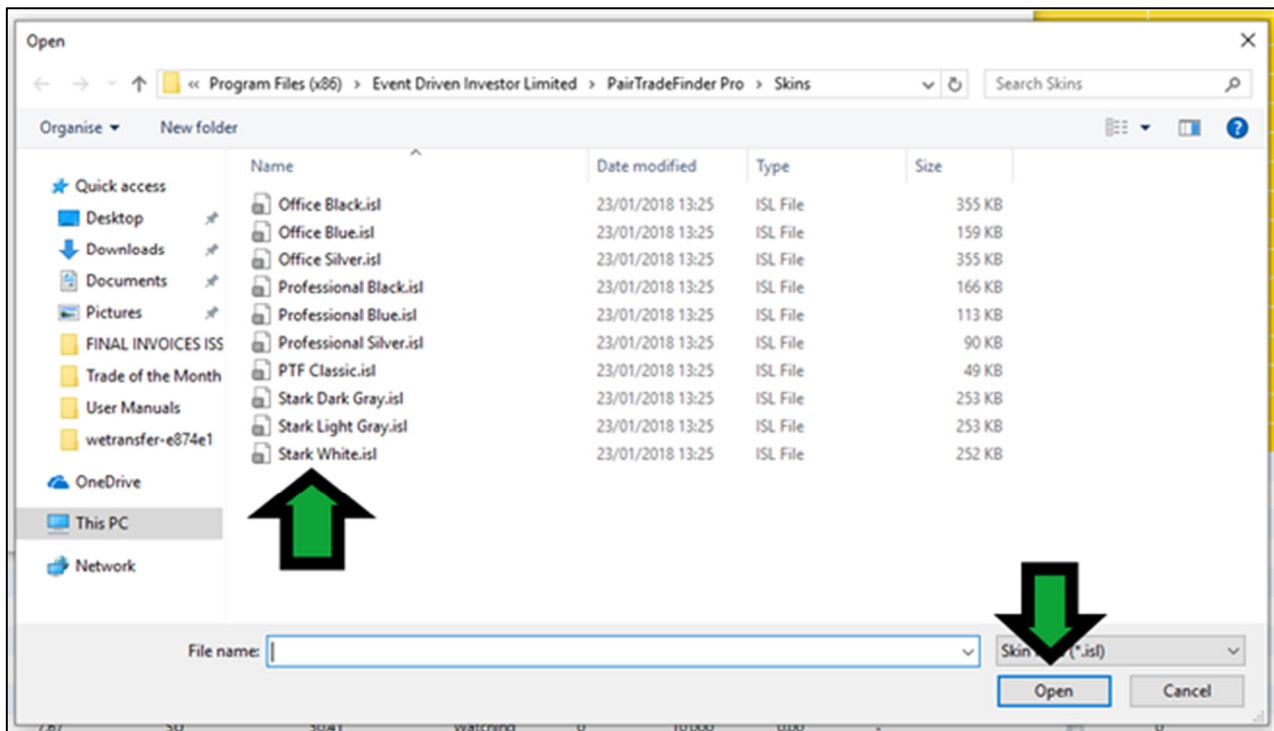


Hit the Change Skin button:

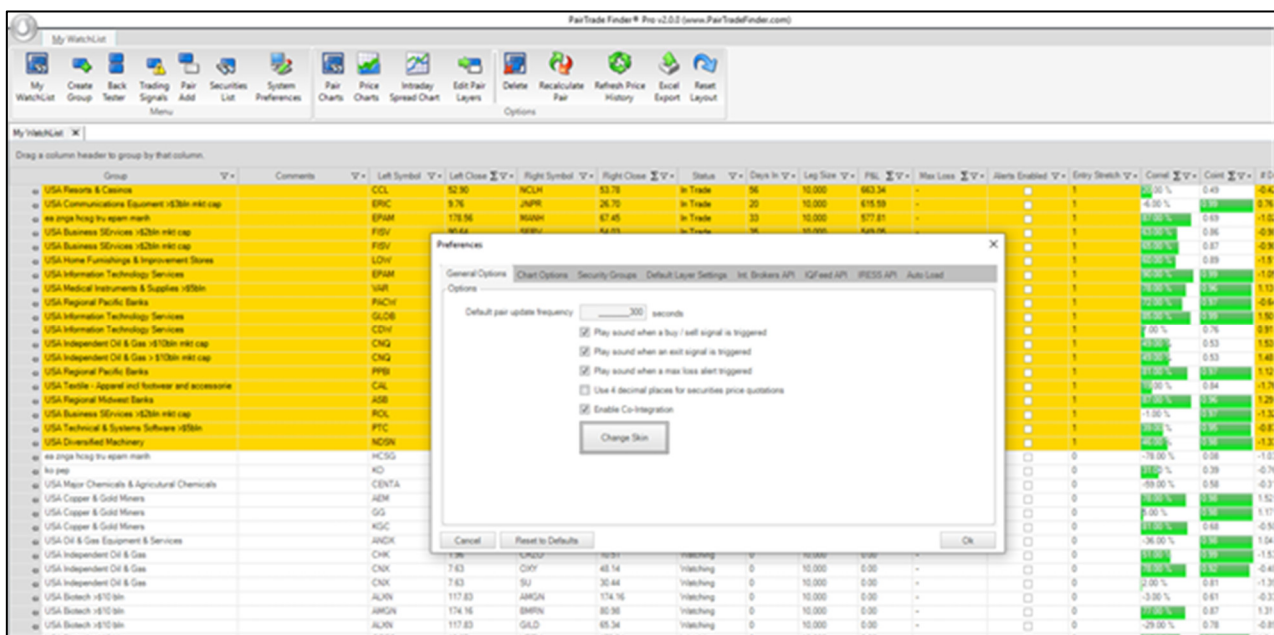


Select one of the nine skins other than Classic to create a different look (Office, Professional and Stark, each offering three different colour palettes). Hit the "Open" button and PTF PRO will automatically change skin:





Example of Office Silver:



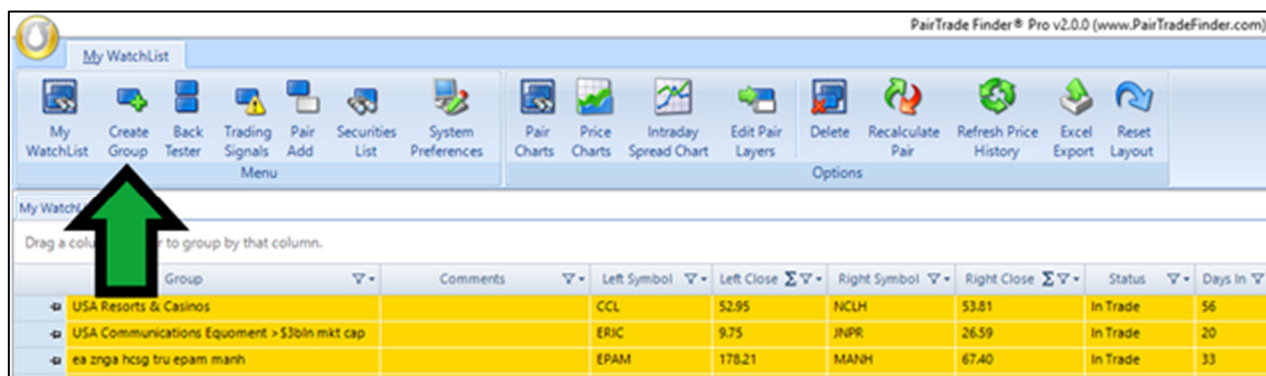
NB: some skins may make Trade Confirmations and other alerts lose colour coding.

## 2 Using PairTrade Finder® PRO

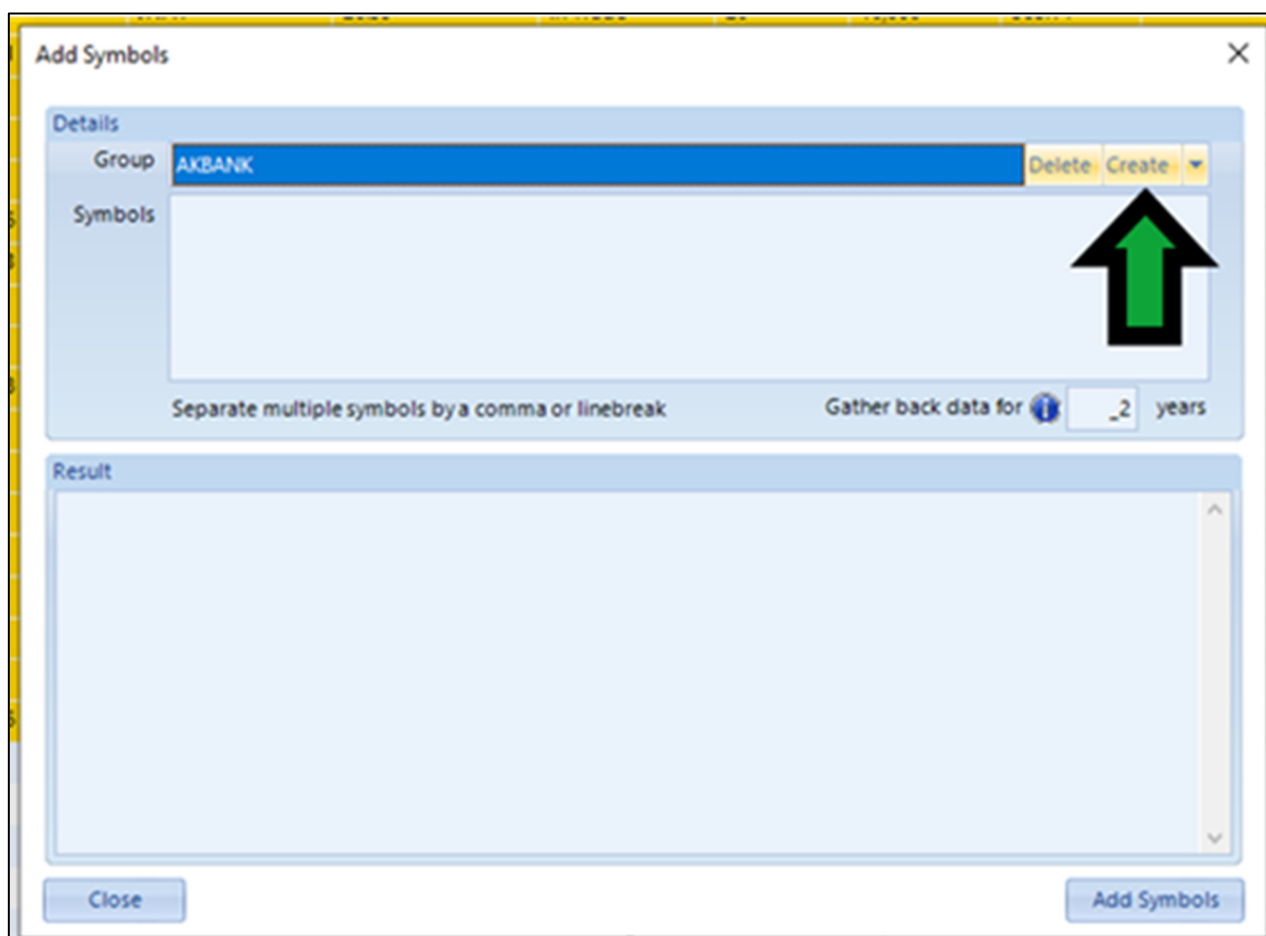
### 2.1 Creating Your First Group

For a detailed Tutorial Video How to Download our Ticker Spreadsheets (Tutorial #2) and of How to Create your first Group (Tutorial #3), please go to <https://pairtradefinder.com/gettingstartedptfpro.html>.

In this example we will create a group of stocks in the USA Consumer Goods sector, in the Personal Products sub-sector. Please click on the **create group** button.

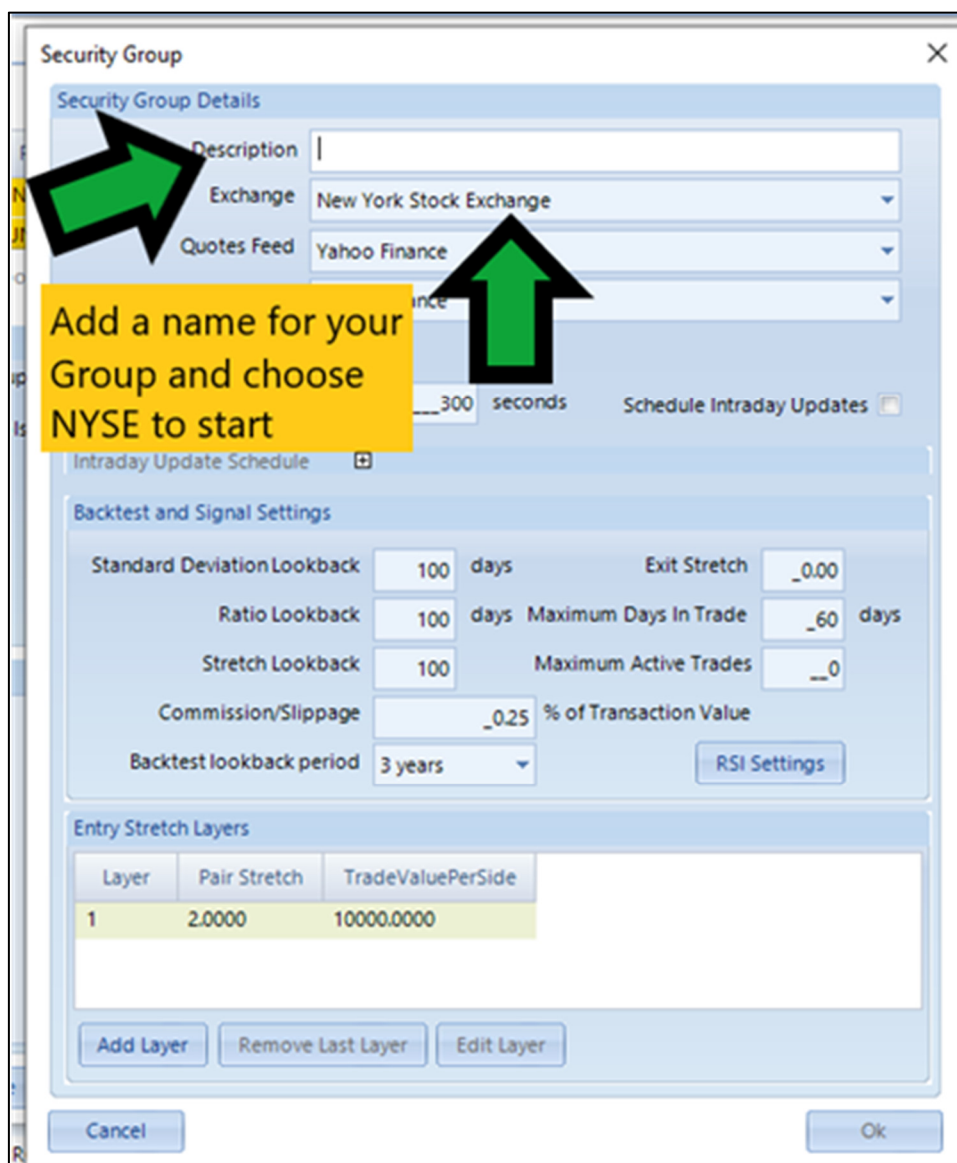


Then click on **create**.



Type a name for your securities group (please note from here forward we will use “stocks” as the default securities, unless otherwise noted). Then **choose the New York Stock Exchange. Click ok.**

We will explain the other settings in this window further into this manual.



**Security Group**

**Security Group Details**

Description:

Exchange: New York Stock Exchange

Quotes Feed: Yahoo Finance

Intraday Update Schedule: 300 seconds ☐ Schedule Intraday Updates

**Backtest and Signal Settings**

Standard Deviation Lookback: 100 days Exit Stretch: 0.00

Ratio Lookback: 100 days Maximum Days In Trade: 60 days

Stretch Lookback: 100 Maximum Active Trades: 0

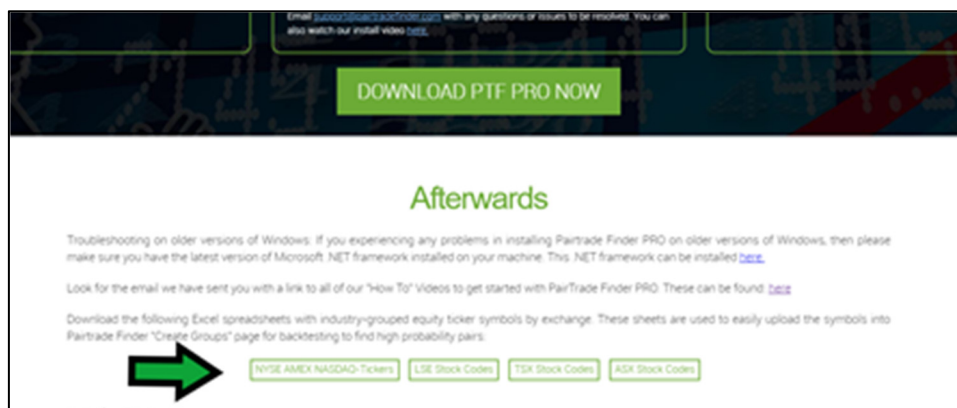
Commission/Slippage: 0.25 % of Transaction Value

Backtest lookback period: 3 years

**Entry Stretch Layers**

Layer	Pair Stretch	TradeValuePerSide
1	2.0000	10000.0000

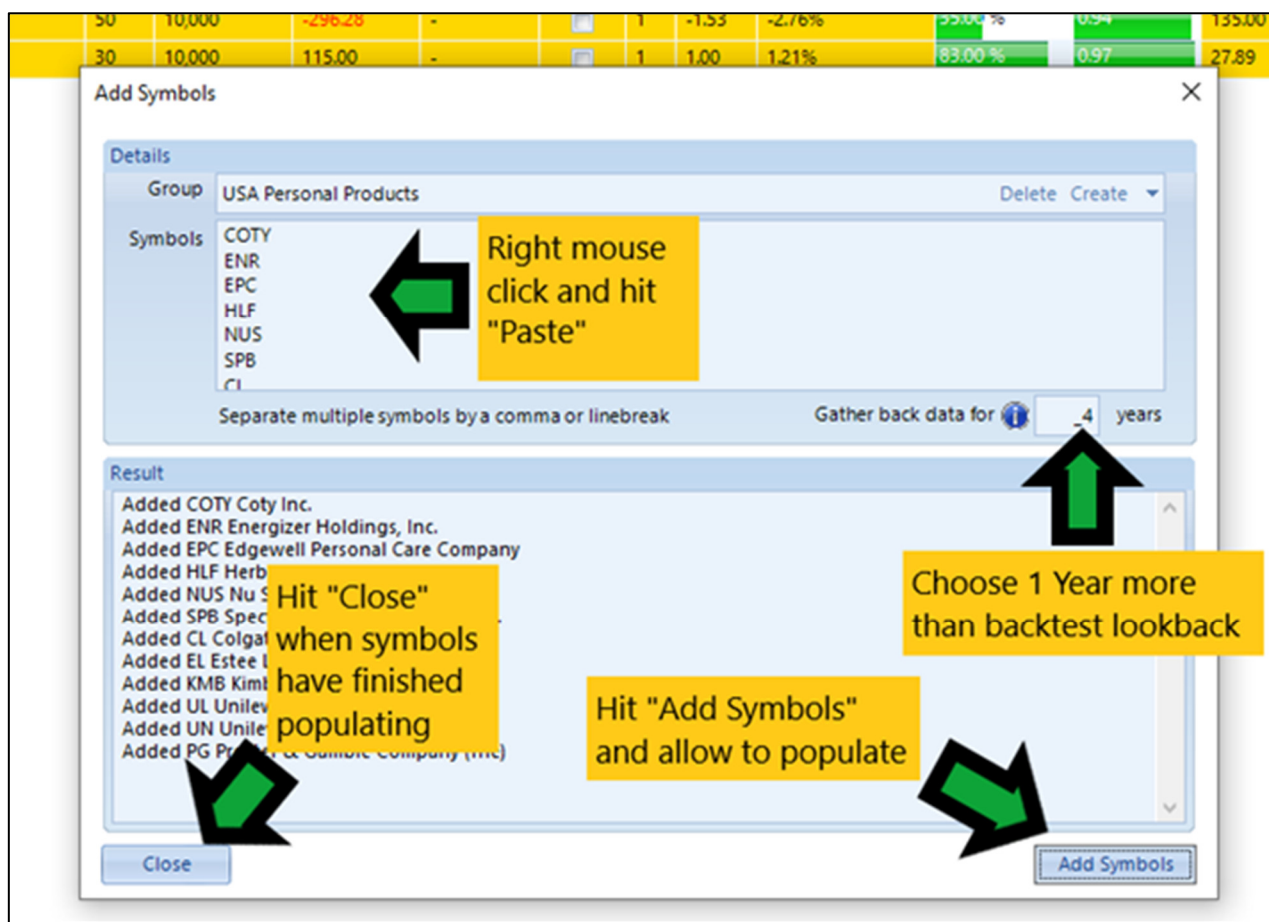
At this point, you will need the ticker symbol Excel Spreadsheets that we offer to you for download. These sheets have been created in order to allow you to quickly and easily download stock tickers/symbols that have been pre-screened to be minimum \$1 billion market capitalisation and with an average daily traded volume of approx. \$2 million or more. These symbols have then been organised by Sector and Industry Sub Sector to allow you to perform your initial fundamental screening. The excels sheets are available for download on the [Download page](#) as follows:



Using the NYSE NASDAQ Amex Tickers Spreadsheet, scroll down to the **Consumer Goods Sector** in column 3, scroll down further to the **Personal Products Industry** section in column 4, select the tickers from column 1 for the companies in that section and right mouse click, then click on copy.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Ticker	Company	Sector	Industry	Country	Market Cap(\$ bln)	Avg Daily Volume(\$)								
1859	KS	KapStone Paper and Packaging Corporation	Consumer Goods	Paper & Paper Products	USA	3.39	\$6,338,372								
1860	UFS	Dorlat Corporation	Consumer Goods	Paper & Paper Products	Canada	3.18	\$10,787,631								
1861	FBR	Fibra Celulose S.A.	Consumer Goods	Paper & Paper Products	Brazil	10.94	\$3,013,578								
1862	WTF	WTF plc	Consumer Goods	Paper & Paper Products	USA	19.80	\$7,892,504								
1863	COTY	Coty Inc.	Consumer Goods	Personal Products	USA	9.81	\$37,386,558								
1864	ENR	Energizer Holdings, Inc.	Consumer Goods	Personal Products	USA	3.82	\$9,431,265								
1865	EPC	Edgewell Personal Care Company	Consumer Goods	Personal Products	USA	3.06	\$9,083,792								
1866	HJF	Herbalife Nutrition Ltd.	Consumer Goods	Personal Products	Cayman Islands	9.65	\$23,161,438								
1867	NUS	No Skin Enterprises, Inc.	Consumer Goods	Personal Products	USA	4.67	\$13,634,676								
1868	SPB	Spectrum Brands Holdings, Inc.	Consumer Goods	Personal Products	USA	4.78	\$5,526,306								
1869	CL	Colgate-Palmolive Company	Consumer Goods	Personal Products	USA	57.86	\$122,646,182								
1870	EL	The Estee Lauder Companies Inc.	Consumer Goods	Personal Products	USA	48.98	\$97,788,194								
1871	KMB	Kimberly-Clark Corporation	Consumer Goods	Personal Products	USA	39.35	\$274,412,074								
1872	UL	Unilever PLC	Consumer Goods	Personal Products	United Kingdom	168.42	\$30,521,604								
1873	UN	Unilever N.V.	Consumer Goods	Personal Products	Netherlands	167.19	\$36,436,773								
1874	PG	The Procter & Gamble Company	Consumer Goods	Personal Products	USA	296.77	\$234,089,352								
1875	WAGF	Westcoast Gasworks Inc.	Consumer Goods	Processed & Packaged Goods	USA	4.42	\$4,366,334								
1876	BGS	B&G Foods, Inc.	Consumer Goods	Processed & Packaged Goods	USA	2.86	\$3,768,515								
1877	FLO	Flowers Foods, Inc.	Consumer Goods	Processed & Packaged Goods	USA	4.34	\$7,948,161								
1878	INGR	Ingredion Incorporated	Consumer Goods	Processed & Packaged Goods	USA	7.19	\$57,558,125								
1879	NOMD	Nomad Foods Limited	Consumer Goods	Processed & Packaged Goods	United Kingdom	3.21	\$4,039,570								
1880	THS	TreeHouse Foods, Inc.	Consumer Goods	Processed & Packaged Goods	USA	2.80	\$9,095,655								
1881	CAG	Conagra Brands, Inc.	Consumer Goods	Processed & Packaged Goods	USA	14.40	\$61,208,102								
1882	CPB	Campbell Soup Company	Consumer Goods	Processed & Packaged Goods	USA	12.74	\$36,623,524								
1883	GIS	General Mills, Inc.	Consumer Goods	Processed & Packaged Goods	USA	27.20	\$81,029,084								
1884	K	Kellogg Company	Consumer Goods	Processed & Packaged Goods	USA	24.67	\$22,926,801								
1885	MKC	McCormick & Company, Incorporated	Consumer Goods	Processed & Packaged Goods	USA	16.07	\$21,918,410								
1886	SJM	The J. M. Smucker Company	Consumer Goods	Processed & Packaged Goods	USA	12.78	\$42,152,880								
1887	BC	Brunswick Corporation	Consumer Goods	Recreational Goods, Other	USA	5.57	\$7,530,251								

In the **create group** box in **PTF PRO**, in the **codes** window, right click on your mouse then **click paste**.



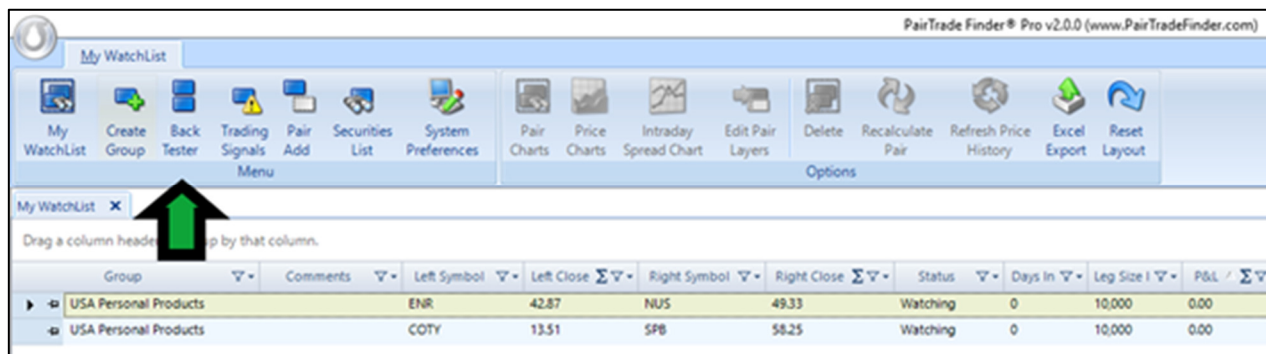
After copying codes, ensure "Gather back data" is set for 1 year more than you are setting your backtest lookback in order to ensure sufficient historical data for the ratio and moving average lookbacks. So, for a 3-year backtest choose minimum 4 years. Then **click on Add Symbols**. You should now see the symbols populate the result box. Once finished, click **Close**.



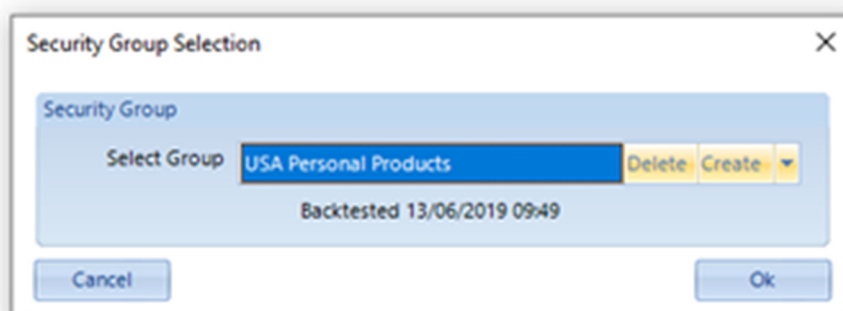
## 2.2 Finding Good Pairs with Back Testing

Now that you have created your first stock group, now is time to back test them to find good pairs to save to your home page. You can watch a detailed Tutorial Video on how to conduct and read a backtest in Tutorial #5 here: <https://pairtradefinder.com/gettingstartedptfpro.html>

Please **click on Backtester** from the front screen.



Select the **Group** you just created. Then **click on ok**.



You will see the backtesting screen appear. Next **highlight all stocks** using the SHIFT key in the left-hand column. You can also click on Group Settings to ensure you are testing the settings you want. These can be modified here to perform various backtests to optimise settings.

**Hit the Group Settings button to check all of the backtest parameters that will be used in the backtest. These can be changed on a backtest-by-backtest basis to optimise settings before saving the best-resulting pairs to My Watchlist (see below).**

**Highlight all tickers to ensure you are backtesting each ticker against all other symbols in the Group.**

**If you wish to backtest two or just a few tickers against each other, click on the first ticker, hold down the CTRL button, and click on the second, third ticker(s) etc. that you wish to select for a backtest of a subset of the Group. These will be shown as highlighted.**

Once you have confirmed the Group Settings are what you want, **click on Find Pairs** and please wait for results to start showing in the blank window, this can take several minutes as the software is crunching huge volumes of data. The "Analysing Pairs" status box will appear in the upper right-hand corner to indicate the backtest is in progress. Every possible pair combination from stocks in the left-hand window is shown in the results.

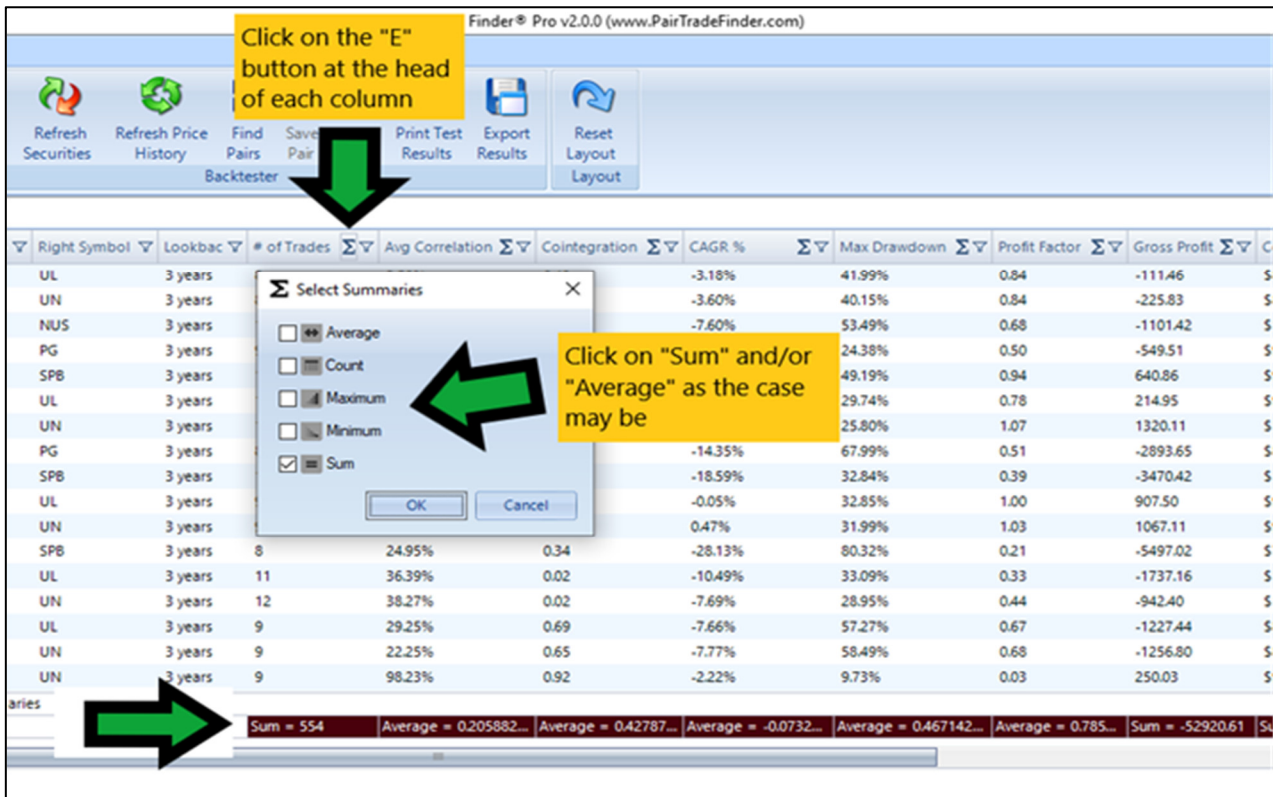
**Click to start the backtest**

**Please wait for results to start showing in the blank window, this can take several minutes as the software is crunching huge volumes of data. Every possible pair combination from stocks in the left hand window is shown in the results.**

The results shown are based on the in-built pair trading system, the same signals that you can receive in real-time going forward. These results provide tangible evidence that our system works in the past: real-data-derived signals and trade results don't lie.

When you see the last two stocks codes paired, in this case its UL & UN, backtesting has finished and the Analysing Pairs status indicator in the upper right-hand corner will disappear.

Now let's sum the number of trades, the profit figures and get the average results for every pair in this group, **click on the E symbol in each column header to select the figures you want to display at the foot of each column.**



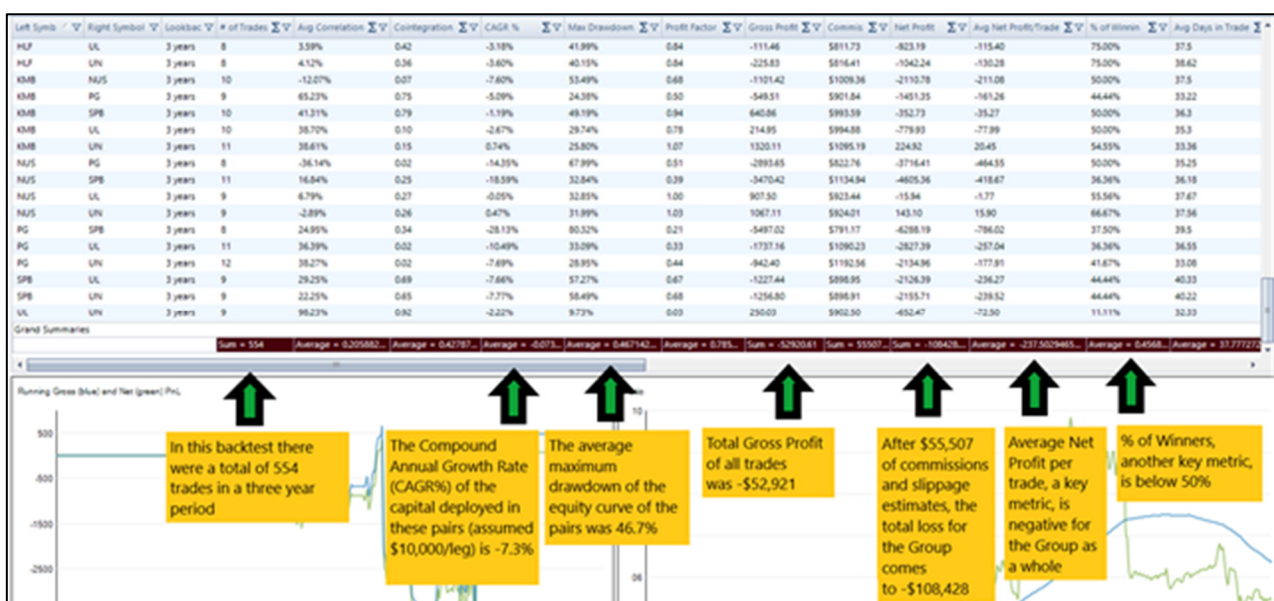
Click on the "E" button at the head of each column

Click on "Sum" and/or "Average" as the case may be

Right Symbol	Lookback	# of Trades	Avg Correlation	Cointegration	CAGR %	Max Drawdown	Profit Factor	Gross Profit
UL	3 years				-3.18%	41.99%	0.84	-111.46
UN	3 years				-3.60%	40.15%	0.84	-225.83
NUS	3 years				-7.60%	53.49%	0.68	-1101.42
SPB	3 years					24.38%	0.50	-549.51
UL	3 years					49.19%	0.94	640.86
UN	3 years					29.74%	0.78	214.95
PG	3 years					25.80%	1.07	1320.11
SPB	3 years				-14.35%	67.99%	0.51	-2893.65
UL	3 years				-18.59%	32.84%	0.39	-3470.42
UN	3 years				-0.05%	32.85%	1.00	907.50
UN	3 years				0.47%	31.99%	1.03	1067.11
SPB	3 years	8	24.95%	0.34	-28.13%	80.32%	0.21	-5497.02
UL	3 years	11	36.39%	0.02	-10.49%	33.09%	0.33	-1737.16
UN	3 years	12	38.27%	0.02	-7.69%	28.95%	0.44	-942.40
UL	3 years	9	29.25%	0.69	-7.66%	57.27%	0.67	-1227.44
UN	3 years	9	22.25%	0.65	-7.77%	58.49%	0.68	-1256.80
UN	3 years	9	98.23%	0.92	-2.22%	9.73%	0.03	250.03

Sum = 554 | Average = 0.205882... | Average = 0.42787... | Average = -0.0732... | Average = 0.467142... | Average = 0.785... | Sum = -52920.61

You can do this for each column. Feel free to average any column you want to get a deeper look at the performance of the group as a whole. Ideally you want to focus on groups that show good performance as a whole, though filtering is key. Shown below is the sum of all trades, the Compound Annual Growth Rate (CAGR%) of those trades, the Maximum Drawdown, Gross Profit, Commissions & Slippage, Net Profit, the average profit per trade and the winning %.





The above results look pretty unattractive in aggregate. Accordingly, you must look to filter all of the Group results to find the most attractive subset of pairs that are worth transferring onto My Watchlist for monitoring.

When it comes to back testing all pair combinations, you want to focus on pairs that have shown good results historically. Historical profitability of fundamentally correlated and cointegrated pairs is the best indicator of future performance that we have. Using the **triangle icon in each column header** you can filter results based on your own defined parameters. Shown below is our backtest filtered to show only pairs that make at least \$300 average profit per trade.

Then click on Custom

Click on the funnel icon

Gross Profit	Commission/Slip	Net Profit	Avg Net Profit/Trade	
94.65		7995.23	(All)	100.00%
18.24			(Custom)	75.00%
54.59	\$786.13	2768.46	(Blanks)	62.50%
94.84	\$413.64	1281.20	(NonBlanks)	25.00%
22.68	\$994.41	2528.27	-1622.08	70.00%
02.09	\$301.87	700.22	-1433.12	66.67%
05.04	\$1198.60	2606.44	-1369.52	66.67%
48.32	\$907.95	1840.37	-1283.40	55.56%
48.30	\$590.31	1157.99	204.49	50.00%
78.12	\$1002.52	575.60	193.00	60.00%
8.00	\$301.20	166.80	57.56	33.33%

Then **filter for pairs above \$300 average profit per trade.**

Change this operator to Greater than or equal to

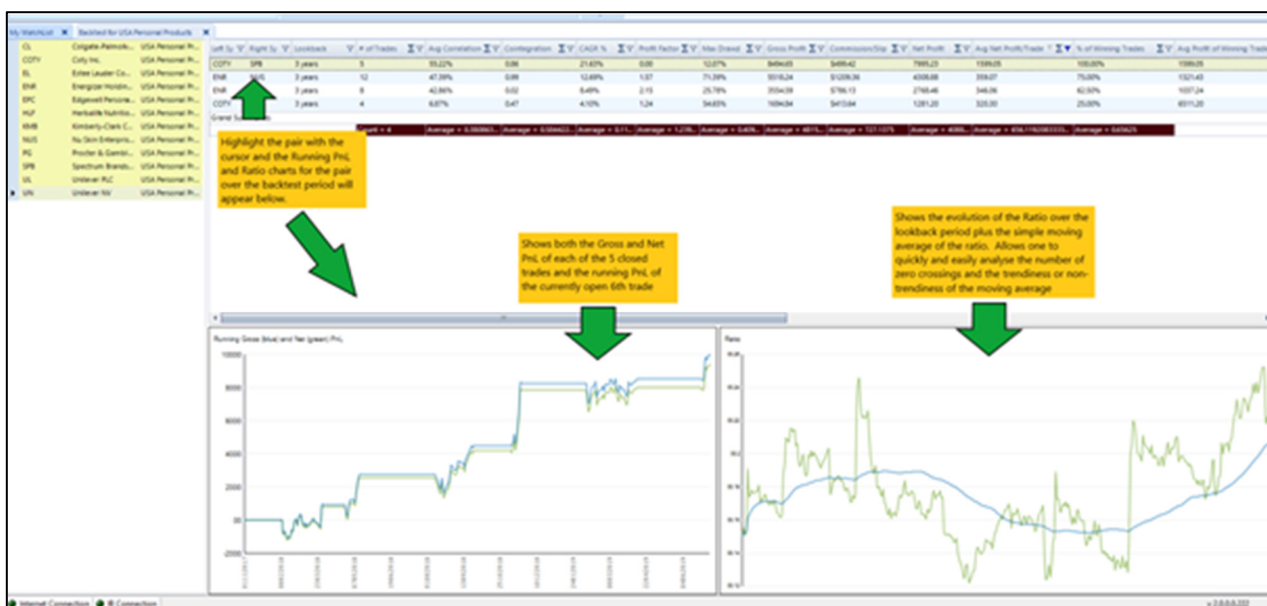
Enter 300 in this box

This filter has reduced the shown pairs down to 4 out of all 66 possible combinations. All pairs showing in the filtered results make at least \$300 per trade (assuming 10k invested per trade). The filter has also increased all our other back test statistics, lifting the average winning trades to 65.6%

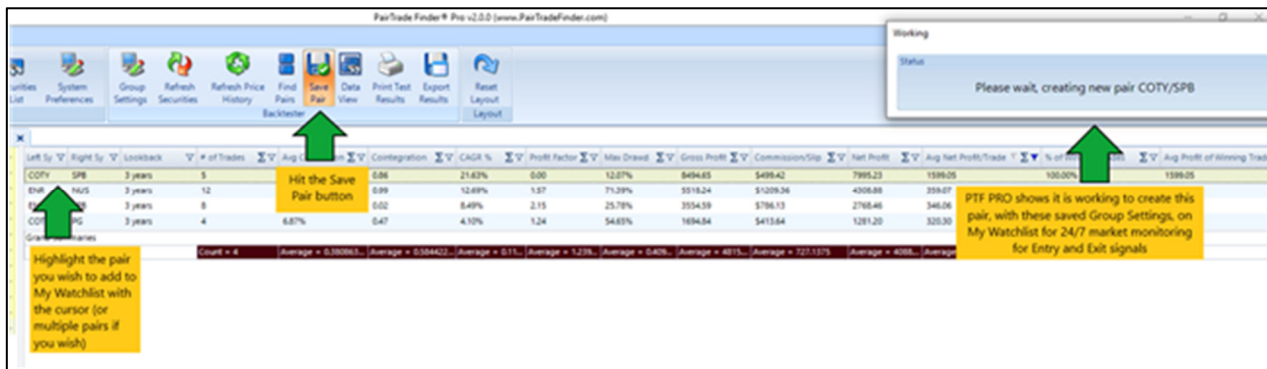
# of Trades	Avg Correlation	Cointegration	CAGR %	Profit Factor	Max Drawd	Gross Profit	Commission/Slip	Net Profit	Avg Net Profit/Trade	% of Winning Trades
5	55.22%	0.86	21.63%	0.00	12.07%	\$494.65	\$499.42	7995.23	1599.05	100.00%
12	47.39%	0.99	12.69%	1.57	71.39%	\$518.24	\$1209.36	4308.88	359.07	75.00%
8	42.86%	0.02	8.49%	2.15	25.78%	\$354.59	\$786.13	2768.46	346.06	62.50%
4	6.87%	0.47	4.10%	1.24	\$4.65%	1694.84	\$413.64	1281.20	320.30	25.00%
Count = 4    Average = 0.380063...    Average = 0.584422...    Average = 0.11...    Average = 1.229...    Average = 0.409...    Average = 4015...    Average = 727.1375    Average = 4088...    Average = 656.1192083333...    Average = 0.65625										

All trade system performance stats have improved as a result of the filter

We can now run a further filter, for example to choose only those pairs with a positive reward/risk ratio if capital were to be continuously deployed in the pair over the backtest period, i.e. that CAGR% is greater than Maximum Drawdown %. Usually, after filtering based on Average Net Profit/Trade > \$300, and % of Winning Trades > 67% (winning 2 out of every 3 trades), one can eyeball whether a pair has a positive CAGR%/Max DD %. In the example above, only the first pair does, delivering a CAGR% of 21.63% over the period vs. a maximum drawdown of only 12.07%. This great reward/risk can also be quickly measured by scanning the PnL chart the appears in the lower left of the page when you highlight the pair. Look to ensure a smooth bottom left to top right equity curve that doesn't have to pay a high proportion of commissions, and also look for a Ratio chart that shows many zero crossings and does not exhibit trendiness:

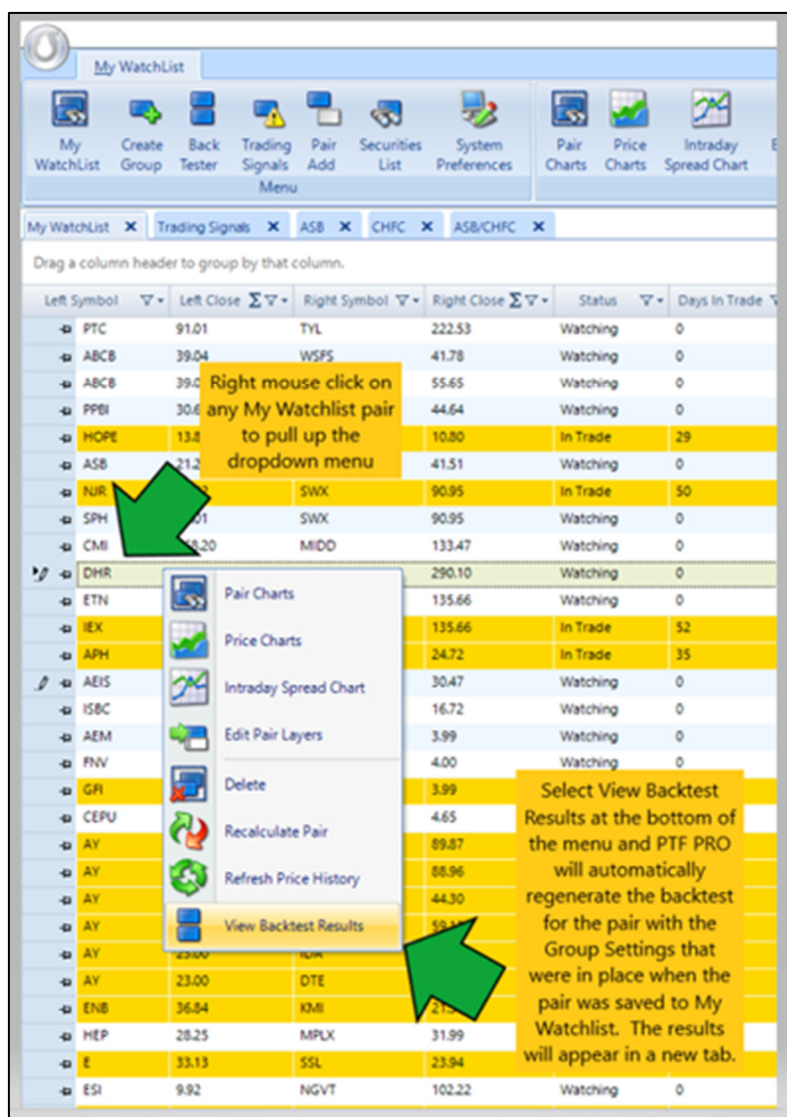


Now we will save only this ONE attractive reward/risk pair COTY/SPB (out of 66 possible pairs in this industry sub-sector group using these backtest parameters) to our home page to monitor further for trading signals from COTY/SPB going forward. Using the SHIFT key again, **highlight this pair in the results window**, then **click on Save Pair**. You can save multiple pairs at once by highlighting all the pairs you wish to add to Watchlist and hitting **Save Pair**:

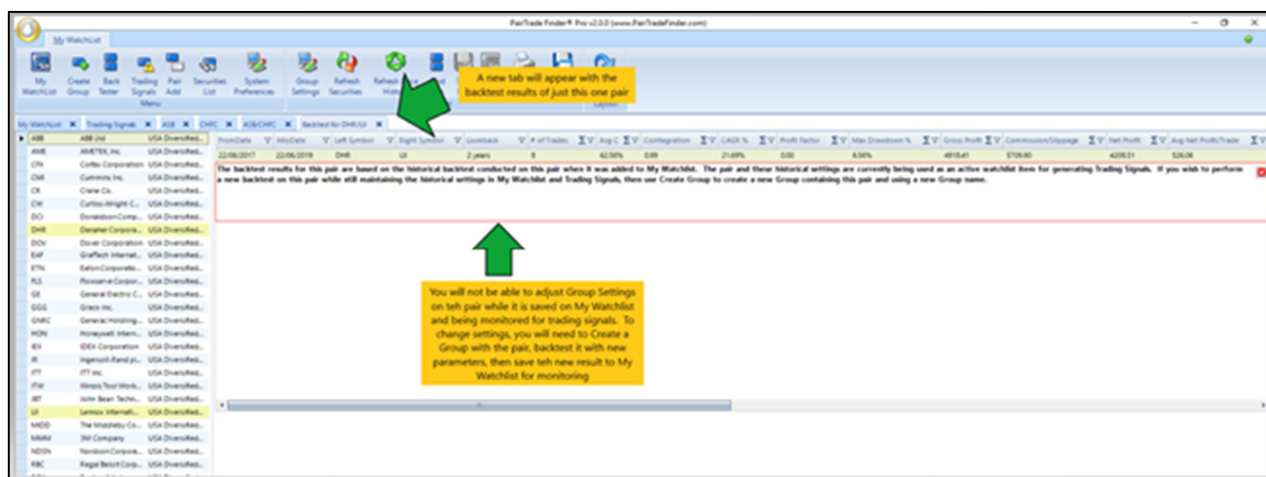


You have now completed a back test, found what we consider to be a possible “high-probability” or “good” pair and added it to your home page. Further screening for Cointegration, News and Fundamental similarity should be applied (more on this later).

A convenient feature of PTF PRO is the ability to view the backtest results of any pair that has been saved to My Watchlist. Simply highlight the pair in My Watchlist, right click on it with the mouse, and select View Backtest Results from the dropdown menu that appears. PTF PRO will automatically regenerate the backtest results for the pair using the Group Settings with which it was saved:



Backtest results show in a new tab:



We encourage you to explore extensively with PairTrade Finder® PRO's backtester. It can backtest your custom system (Group Settings) on up to 10 years' worth of historical data, using various scenarios of Group Settings, Layers etc. and you can deploy any combination of filters you see fit to the results to select your choicest pairs for monitoring. As you can see above, results are shown in the backtester for each pair in the following order:

1. Left Symbol
2. Right Symbol
3. Lookback Period for the Backtest
4. Number of Trades
5. Average Correlation
6. Cointegration
7. Compound Annual Growth Rate % (CAGR%)
8. Profit Factor
9. Maximum Drawdown % (MaxDD%)
10. Gross Profit
11. Commissions/Slippage Estimate
12. Net Profit
13. Average Net Profit/Trade
14. %age of Winning Trades
15. Average Profit of Winning Trades
16. Average Loss of Losing Trades
17. Median Net Profit/Trade
18. Average Winning/losing Ratio
19. Biggest Win
20. Biggest Loss
21. Average Days in Trade
22. Total PnL minus Biggest Win

23. Total PnL minus Biggest Loss

24. RSI Period for Charting

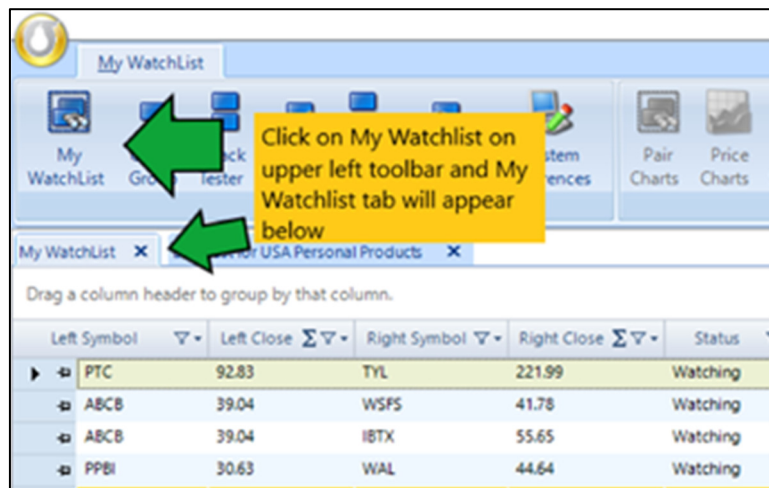
25. Whether the Pair is already in My Watchlist or not. Pairs in a backtest that are already in My Watchlist will also show up as highlighted in GOLD in the backtest results and will display the pair results of the original Group Settings for the backtest you used when you saved the pair to My Watchlist. This feature preserves database and trading signal integrity.

Please note the order of all output columns can be customised – just click on the column header and drag it to the position to which you wish to move it. Your customised layout will be saved.

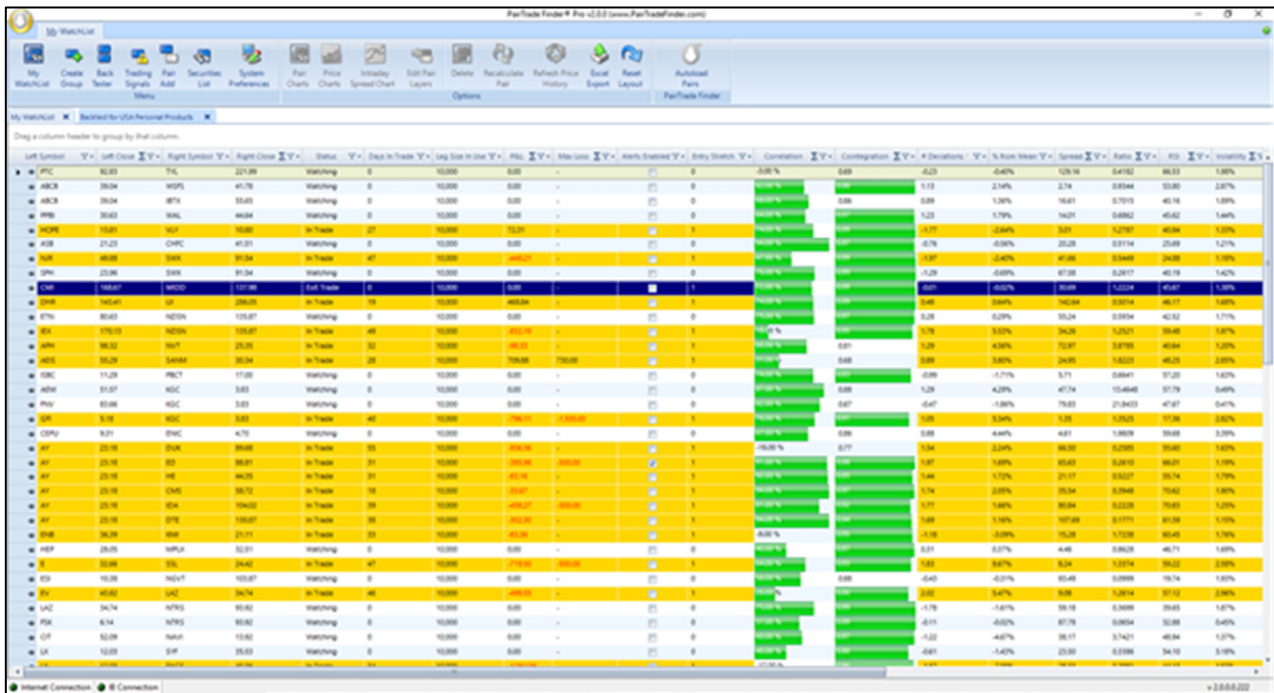


## 2.3 Monitoring All Your Pairs at Once

Now that you have created your first stock group, found and saved a good pair via the backtester, you can now repeat the process to generate a portfolio of My Watchlist pairs and view all your pairs on one screen. Please click on the My Watchlist icon.



The below screen will appear with all your saved pairs populated (in this example we show a well populated Watchlist with many other pairs included).



Left Symbol	Left Close	Right Symbol	Right Close	Status
PTC	92.83	TYL	221.99	Watching
ABCB	39.04	WSFS	41.78	Watching
ABCB	39.04	IBTX	55.65	Watching
PPBI	30.63	WAL	44.64	Watching

In this My Watchlist page you can rank and filter for different values the same as the backtester:

[illegible]

Below are two contiguous screenshots with definitions for each column contained on My Watchlist:

ParTrade Finder v2.0.0 (www.ParTradeFinder.com)

My WatchList

Left symbol in the pair, latest Intraday price from feed (or Adjusted EOD Close Price if out of market hours)

Right symbol in the pair, latest Intraday price from feed (or Adjusted EOD Close Price if out of market hours)

For those pairs still In Trade, column displays the number of days since the trade was opened

Running Profit & Loss of the trade that is open

Toggle On/Off box for the user defined Max Loss Alert Setting

Average correlation of the pair over the LOOKBACK period set in its Group Settings (default = 100 days)

Cointegration result of the pair over the LOOKBACK period set in its Group Settings (default = 100 days)

Left Symbol	Left Close	Right Symbol	Right Close	Status	Days In Trade	Leg Size in Use	P&L	Max Loss	Alerts Enabled	Entry Stretch	Correlation	Cointegration
HODPE	13.81	VLY	10.80	Out	27	10,000	72.31	-	<input type="checkbox"/>	1	74.00%	0.99
NDR	48.88	SWX	91.54	In	47	10,000	-449.21	-	<input type="checkbox"/>	1	47.00%	0.99
SPH	23.96	SWX	91.54	Out	0	10,000	0.00	-	<input type="checkbox"/>	1	74.00%	0.99
CMR	168.62	MDO	137.88	Out	0	10,000	0.00	-	<input type="checkbox"/>	1	74.00%	0.99
QMR	343.41	SR	256.05	Out	18	10,000	8.86	-	<input type="checkbox"/>	1	74.00%	0.99
LAC	34.74	NTRS	93.92	Out	0	10,000	0.00	-	<input type="checkbox"/>	1	74.00%	0.99
PSK	6.74	NTRS	93.92	Out	0	10,000	0.00	-	<input type="checkbox"/>	1	74.00%	0.99
BAP	234.77	BSAC	30.18	Out	0	10,000	0.00	-	<input type="checkbox"/>	1	74.00%	0.99
ERIC	9.40	JNPR	27.36	Out	0	10,000	0.00	-	<input type="checkbox"/>	1	74.00%	0.99

The screenshot displays the PTF PRO software interface with several annotations explaining the data presented:

- Number of Standard Deviations (sd) of the current Core Ratio from the Standard Moving Average of the Core Ratio** [Core Ratio = Left Price/(Left Price + Right Price)]
- Spread** is the \$ value difference of the highest price stock in the pair minus the lowest price stock in the pair
- RSI of the Ratio** based on RSI lookback setting (default = 14 days). Look for oversold/undersold and divergences
- Shows you when the data was updated last in the system. Shows as "Pending" until the next data update comes in at market open
- Displays to which Group the pair belongs. Remember each pair gets its Watchlist settings from the Group Settings of its Group
- Refers to the "maximum in trade" feature which allows you to specify a maximum amount of open trades at any time in a Group, for use in tandem with user's portfolio management system

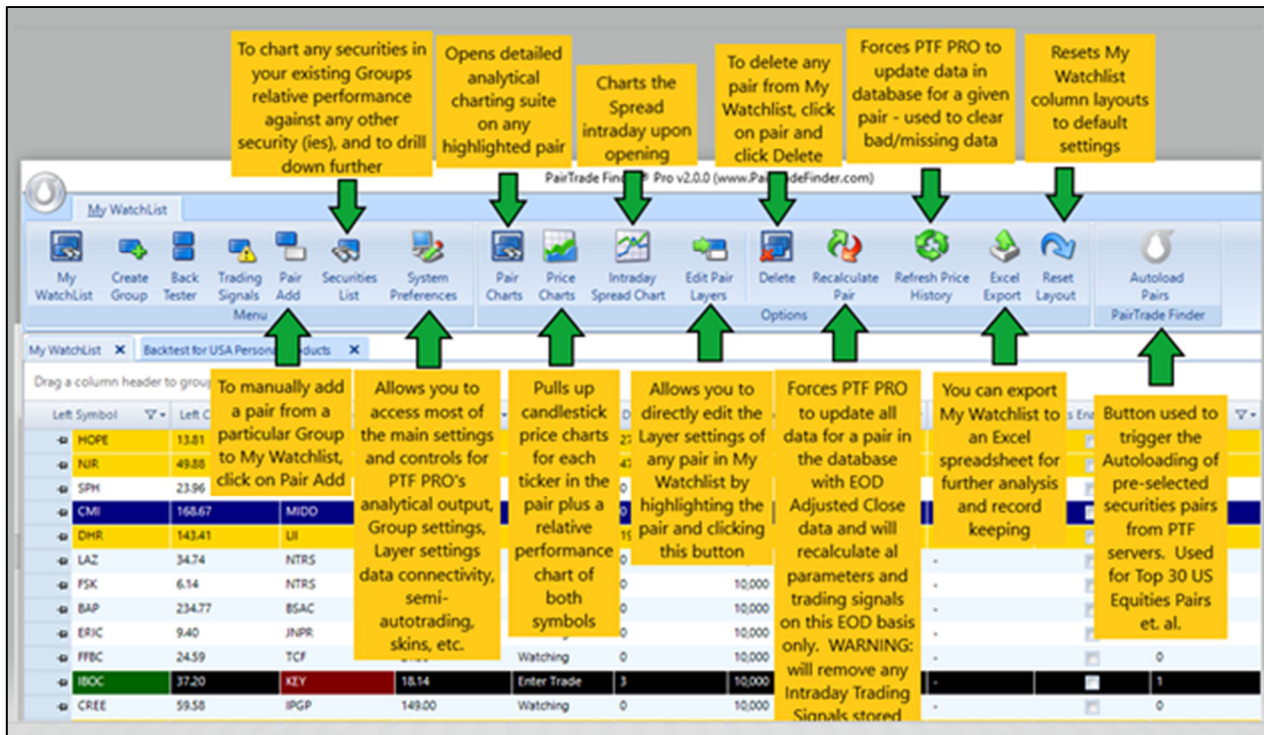
The table below shows the data for the first few rows, with green arrows indicating the fields explained in the annotations above:

# Deviations	% from Mean	Spread	Ratio	RSI	Volatility	Last Checked	Signals Enabled	Group	Comments	Active
-1.77	-2.64%	3.01	1.27%	40.94	1.33%	07/07/2019 14:54	<input checked="" type="checkbox"/>	USA Regional Banks All 27/1.0 3 years IB		Yes
-1.97	-2.64%	41.66	24.88	1.33%	1.33%	07/07/2019 14:53	<input checked="" type="checkbox"/>	USA Gas Util		Yes
-1.36	-2.64%	47.44	24.88	10.19	1.42%	07/07/2019 14:53	<input checked="" type="checkbox"/>	USA Gas Util		No

Additional annotations at the bottom of the screenshot explain the 'Comments' field and the 'Active' column:

- % distance of the current Core Ratio, based on Intraday feed or EOD Adjusted Close price, as the case may be, from the mean of the Core Ratio over the lookback period. The higher the % the more stretched is the Core Ratio**
- Simple ratio of left stock price divided by the right stock price**
- Volatility of the pair based on daily %age changes of the Ratio. Beware of high volatility pairs and reduce position size**
- Shows whether the pair in question currently has Signals Enabled meaning PTF PRO will generate Entry and Exit signals. Can be toggled on and off on a pair-by-pair basis
- Allows user to add commentary on any pair and Group, e.g. "IB datafeed" or "USA Regional Banks"

Shown below are the functions of most of the other buttons you will find on the My Watchlist home screen:



The screenshot shows the PairTrade Finder Pro v2.0.0 interface. The top menu bar includes: My WatchList, Create Group, Back Tester, Trading Signals, Pair Add, Securities List, System Preferences, Pair Charts, Price Charts, Intraday Spread Chart, Edit Pair Layers, Delete, Recalculate Pair, Refresh Price History, Excel Export, Reset Layout, and Autoload Pairs. The main window displays a table of securities with columns for Left Symbol, Left C, Right Symbol, Right C, and various trading parameters. Callouts provide detailed functions for various buttons and features:

- To chart any securities in your existing Groups relative performance against any other security (ies), and to drill down further** (points to Pair Charts)
- Opens detailed analytical charting suite on any highlighted pair** (points to Price Charts)
- Charts the Spread intraday upon opening** (points to Intraday Spread Chart)
- To delete any pair from My Watchlist, click on pair and click Delete** (points to Delete)
- Forces PTF PRO to update data in database for a given pair - used to clear bad/missing data** (points to Recalculate Pair)
- Resets My Watchlist column layouts to default settings** (points to Reset Layout)
- To manually add a pair from a particular Group to My Watchlist, click on Pair Add** (points to Pair Add)
- Allows you to access most of the main settings and controls for PTF PRO's analytical output, Layer settings, Group settings, data connectivity, semi-autotrading, skins, etc.** (points to System Preferences)
- Pulls up candlestick price charts for each ticker in the pair plus a relative performance chart of both symbols** (points to Price Charts)
- Allows you to directly edit the Layer settings of any pair in My Watchlist by highlighting the pair and clicking this button** (points to Edit Pair Layers)
- Forces PTF PRO to update all data for a pair in the database with EOD Adjusted Close data and will recalculate all parameters and trading signals on this EOD basis only. WARNING: will remove any Intraday Trading Signals stored** (points to Recalculate Pair)
- You can export My Watchlist to an Excel spreadsheet for further analysis and record keeping** (points to Excel Export)
- Button used to trigger the Autoloading of pre-selected securities pairs from PTF servers. Used for Top 30 US Equities Pairs et. al.** (points to Autoload Pairs)

As you can see My Watchlist is your bird's eye view of your all pairs at once. From this screen you can rank them according to the different columns, filter to only show pairs currently in a trade, filter to show only a particular group, add Max Loss Alerts or Trailing Stops, etc.

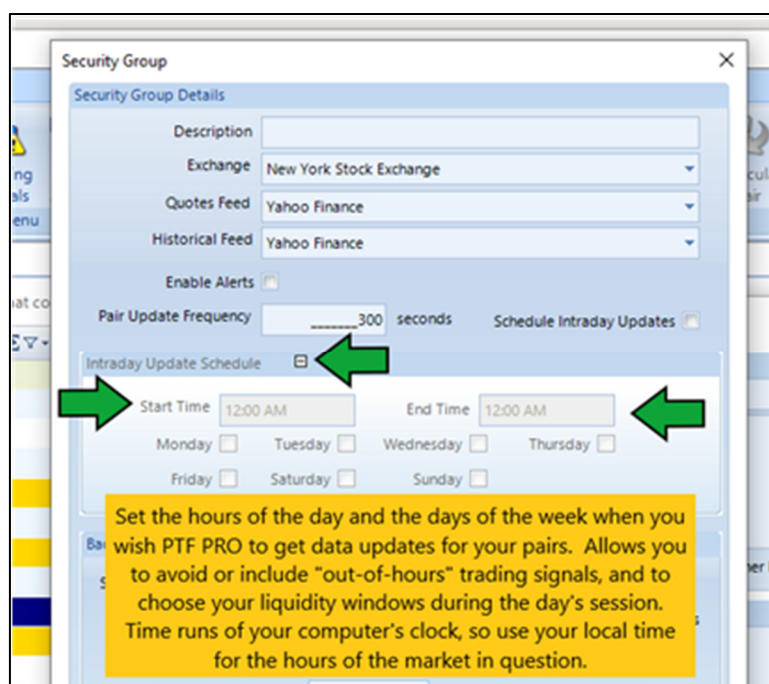
Please continue onto section 2.4 for information on how to monitor for trading signals.



## 2.4 Receiving Entry and Exit Signals on Your Pairs

In 2.1, 2.2 and 2.3 above, you have now learned to create a securities group, find and save good pairs to My Watchlist and to use My Watchlist to monitor many aspects of your pairs all at once. This section will now show you how you can use the Trading Signals window to monitor for upcoming trading signals.

Trading signals will come in during market hours **or your specified time**. PTF PRO allows you, when you use Create Group, to define exactly **when** data for your Group will be updated.

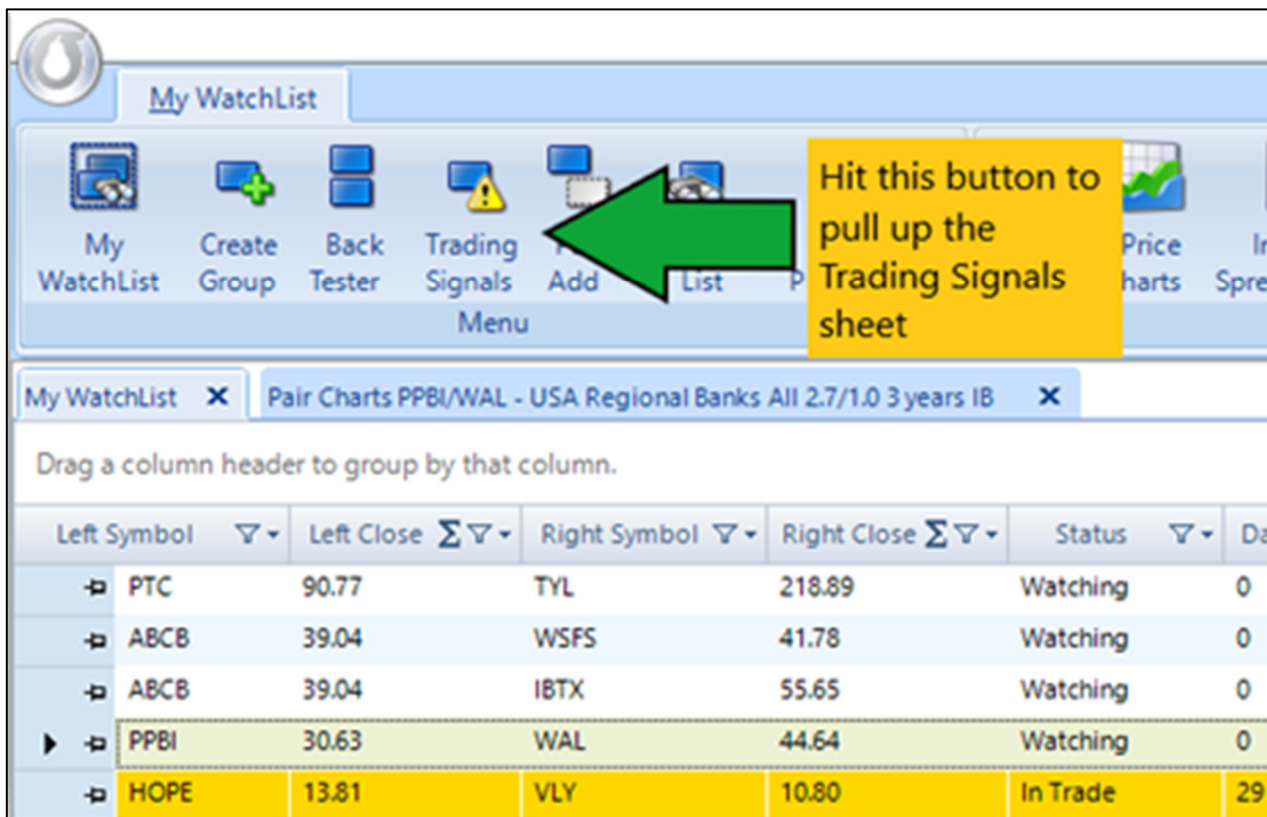


So, for example, if you are trading the U.S. session from 9:30 a.m. to 4:00 p.m. EST, and you are in London, UK, on GMT you would set the Start Time and End Time as 2:30 p.m. and 9:00 p.m. respectively to cover the full U.S. session and provided your computer's clock is on GMT.

If the Intraday Update Schedule is not set, PTF PRO will pull data for your securities in the Group 24/7, including out-of-hours market prices. Be careful with out-of-hours updates as markets are very thinly traded and liquidity is often poor.

## Monitoring Trading Signals

Please **click on the trading signals** button.



My WatchList

My WatchList Create Group Back Tester Trading Signals Add List Price Charts In Spread

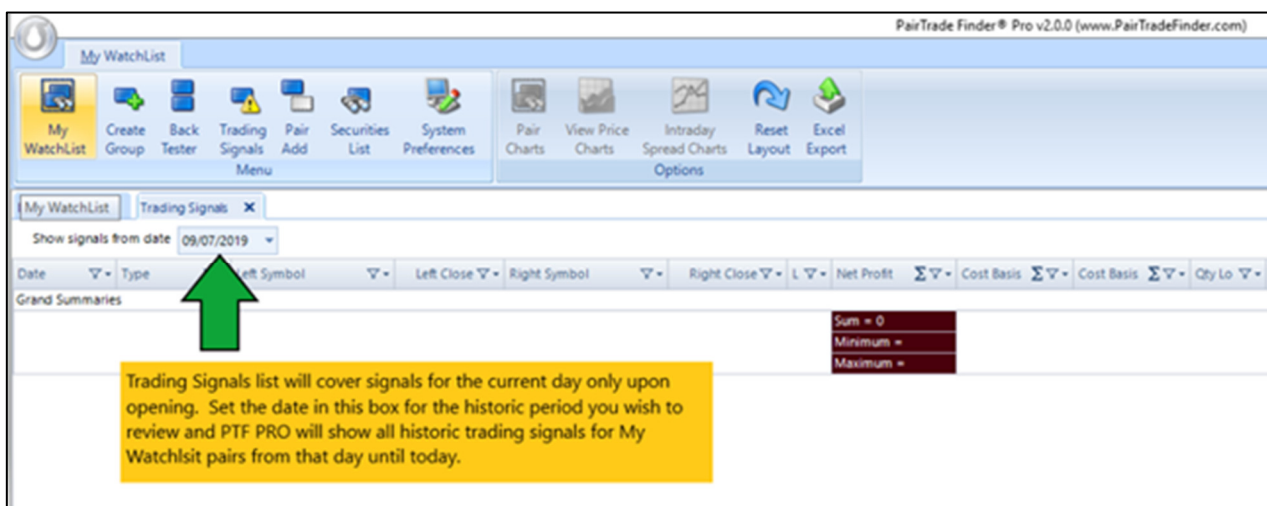
Hit this button to pull up the Trading Signals sheet

My WatchList x Pair Charts PPBI/WAL - USA Regional Banks All 2.7/1.0 3 years IB x

Drag a column header to group by that column.

Left Symbol	Left Close	Right Symbol	Right Close	Status	Date
PTC	90.77	TYL	218.89	Watching	0
ABCB	39.04	WSFS	41.78	Watching	0
ABCB	39.04	IBTX	55.65	Watching	0
PPBI	30.63	WAL	44.64	Watching	0
HOPE	13.81	VLV	10.80	In Trade	29

It will be blank until new trading signals are generated by the software.



PairTrade Finder® Pro v2.0.0 (www.PairTradeFinder.com)

My WatchList

My WatchList Create Group Back Tester Trading Signals Pair Add Securities List System Preferences Pair Charts View Price Charts Intraday Spread Charts Reset Layout Excel Export Options

My WatchList Trading Signals x

Show signals from date 09/07/2019

Date	Type	Left Symbol	Left Close	Right Symbol	Right Close	L	Net Profit	Cost Basis	Cost Basis	Qty Lo
Grand Summaries										
Sum = 0										
Minimum =										
Maximum =										

Trading Signals list will cover signals for the current day only upon opening. Set the date in this box for the historic period you wish to review and PTF PRO will show all historic trading signals for My Watchlist pairs from that day until today.

Below is how your Trading Signals window will look once new trading signals come in, or you set a "from date" in the upper left box from which signals on My Watchlist pairs have been generated. You can sort the signals using the same E, filter and triangle icons in the column headers, e.g. by Group, by Type (Entry or Exit), Net Profit, Layers, Days in Trade etc.

File

View

Tools

Help

PairTrade Finder PRO v2.0.0 (www.PairTradeFinder.com)

Trading Signals

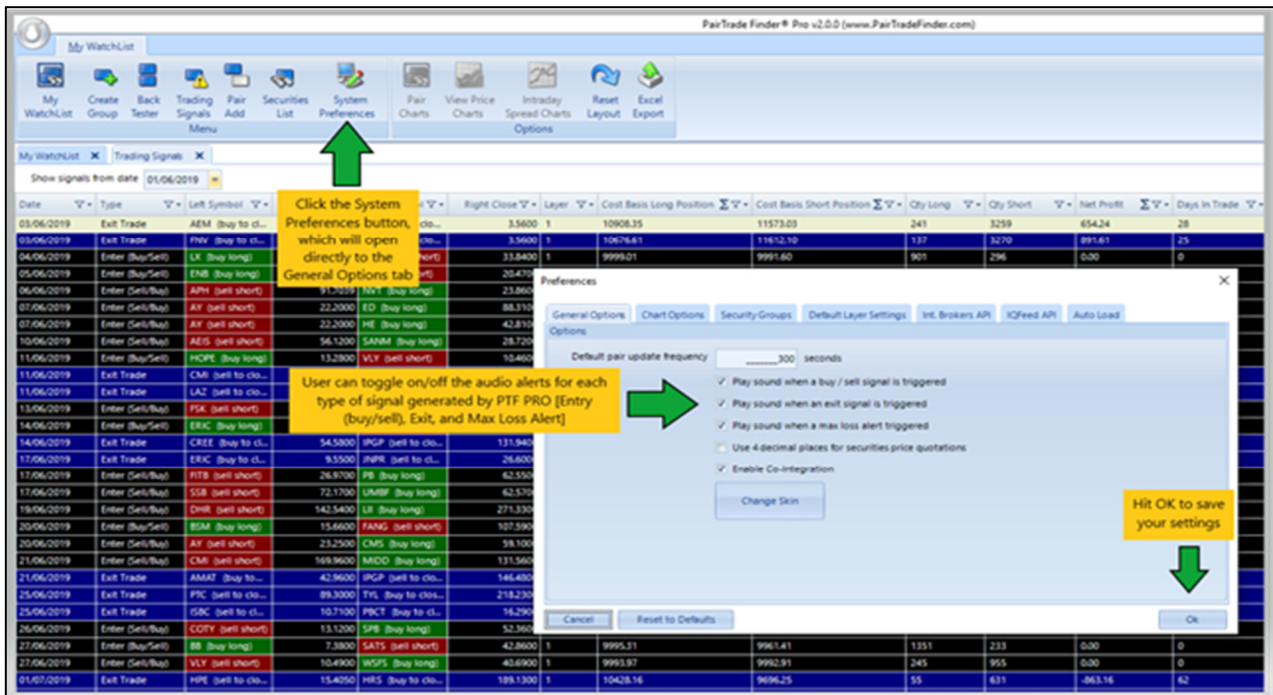
Signals from 2019-05-06 2019-05-06

Date	Type	Left Symbol	Left Close	Right Symbol	Right Close	Layer	Cost Base Long Position	Cost Base Short Position	Qty Long	Qty Short	Net Profit	Days in Trade	Ratio	Std Dev	Timestamp	Action	Group
05/06/2019	Buy	ADFF	Buy to d.c.	45.1000	ADFF	Buy to d.c.	3.0000	10000.00	10000.00	10000.00	0.00	0	0.00	0.00	05/06/2019 10:00	Placed at Market	USA Regional Banks
05/06/2019	Buy	ADFF	Buy to d.c.	45.1000	ADFF	Buy to d.c.	3.0000	10000.00	10000.00	10000.00	0.00	0	0.00	0.00	05/06/2019 10:00	Placed at Market	USA Regional Banks
05/06/2019	Buy	ADFF	Buy to d.c.	45.1000	ADFF	Buy to d.c.	3.0000	10000.00	10000.00	10000.00	0.00	0	0.00	0.00	05/06/2019 10:00	Placed at Market	USA Regional Banks
05/06/2019	Buy	ADFF	Buy to d.c.	45.1000	ADFF	Buy to d.c.	3.0000	10000.00	10000.00	10000.00	0.00	0	0.00	0.00	05/06/2019 10:00	Placed at Market	USA Regional Banks
05/06/2019	Buy	ADFF	Buy to d.c.	45.1000	ADFF	Buy to d.c.	3.0000	10000.00	10000.00	10000.00	0.00	0	0.00	0.00	05/06/2019 10:00	Placed at Market	USA Regional Banks
05/06/2019	Buy	ADFF	Buy to d.c.	45.1000	ADFF	Buy to d.c.	3.0000	10000.00	10000.00	10000.00	0.00	0	0.00	0.00	05/06/2019 10:00	Placed at Market	USA Regional Banks
05/06/2019	Buy	ADFF	Buy to d.c.	45.1000	ADFF	Buy to d.c.	3.0000	10000.00	10000.00	10000.00	0.00	0	0.00	0.00	05/06/2019 10:00	Placed at Market	USA Regional Banks
05/06/2019	Buy	ADFF	Buy to d.c.	45.1000	ADFF	Buy to d.c.	3.0000	10000.00	10000.00	10000.00	0.00	0	0.00	0.00	05/06/2019 10:00	Placed at Market	USA Regional Banks
05/06/2019	Buy	ADFF	Buy to d.c.	45.1000	ADFF	Buy to d.c.	3.0000	10000.00	10000.00	10000.00	0.00	0	0.00	0.00	05/06/2019 10:00	Placed at Market	USA Regional Banks
05/06/2019	Buy	ADFF	Buy to d.c.	45.1000	ADFF	Buy to d.c.	3.0000	10000.00	10000.00	10000.00	0.00	0	0.00	0.00	05/06/2019 10:00	Placed at Market	USA Regional Banks
05/06/2019	Buy	ADFF	Buy to d.c.	45.1000	ADFF	Buy to d.c.	3.0000	10000.00	10000.00	10000.00	0.00	0	0.00	0.00	05/06/2019 10:00	Placed at Market	USA Regional Banks
05/06/2019	Buy	ADFF	Buy to d.c.	45.1000	ADFF	Buy to d.c.	3.0000	10000.00	10000.00	10000.00	0.00	0	0.00	0.00	05/06/2019 10:00	Placed at Market	USA Regional Banks
05/06/2019	Buy	ADFF	Buy to d.c.	45.1000	ADFF	Buy to d.c.	3.0000	10000.00	10000.00	10000.00	0.00	0	0.00	0.00	05/06/2019 10:00	Placed at Market	USA Regional Banks
05/06/2019	Buy	ADFF	Buy to d.c.	45.1000	ADFF	Buy to d.c.	3.0000	10000.00	10000.00	10000.00	0.00	0	0.00	0.00	05/06/2019 10:00	Placed at Market	USA Regional Banks
05/06/2019	Buy	ADFF	Buy to d.c.	45.1000	ADFF	Buy to d.c.	3.0000	10000.00	10000.00	10000.00	0.00	0	0.00	0.00	05/06/2019 10:00	Placed at Market	USA Regional Banks
05/06/2019	Buy	ADFF	Buy to d.c.	45.1000	ADFF	Buy to d.c.	3.0000	10000.00	10000.00	10000.00	0.00	0	0.00	0.00	05/06/2019 10:00	Placed at Market	USA Regional Banks
05/06/2019	Buy	ADFF	Buy to d.c.	45.1000	ADFF	Buy to d.c.	3.0000	10000.00	10000.00	10000.00	0.00	0	0.00	0.00	05/06/2019 10:00	Placed at Market	USA Regional Banks
05/06/2019	Buy	ADFF	Buy to d.c.	45.1000	ADFF	Buy to d.c.	3.0000	10000.00	10000.00	10000.00	0.00	0	0.00	0.00	05/06/2019 10:00	Placed at Market	USA Regional Banks
05/06/2019	Buy	ADFF	Buy to d.c.	45.1000	ADFF	Buy to d.c.	3.0000	10000.00	10000.00	10000.00	0.00	0	0.00	0.00	05/06/2019 10:00	Placed at Market	USA Regional Banks
05/06/2019	Buy	ADFF	Buy to d.c.	45.1000	ADFF	Buy to d.c.	3.0000	10000.00	10000.00	10000.00	0.00	0	0.00	0.00	05/06/2019 10:00	Placed at Market	USA Regional Banks
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05/06/2019	Buy	ADFF	Buy to d.c.	45.1000	ADFF	Buy to d.c.	3.0000	10000.00	10000.00	10000.00	0.00	0	0.00	0.00	05/06/2019 10:00	Placed at Market	USA Regional Banks
05/06/2019	Buy	ADFF	Buy to d.c.	45.1000	ADFF	Buy to d.c.	3.0000	10000.00	10000.00	10000.00	0.00	0	0.00	0.00	05/06/2019 10:00	Placed at Market	USA Regional Banks
05/06/2019	Buy	ADFF	Buy to d.c.	45.1000	ADFF	Buy to d.c.	3.0000	10000.00	10000.00	10000.00	0.00	0	0.00	0.00	05/06/2019 10:00	Placed at Market	USA Regional Banks
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05/06/2019	Buy	ADFF	Buy to d.c.	45.1000													

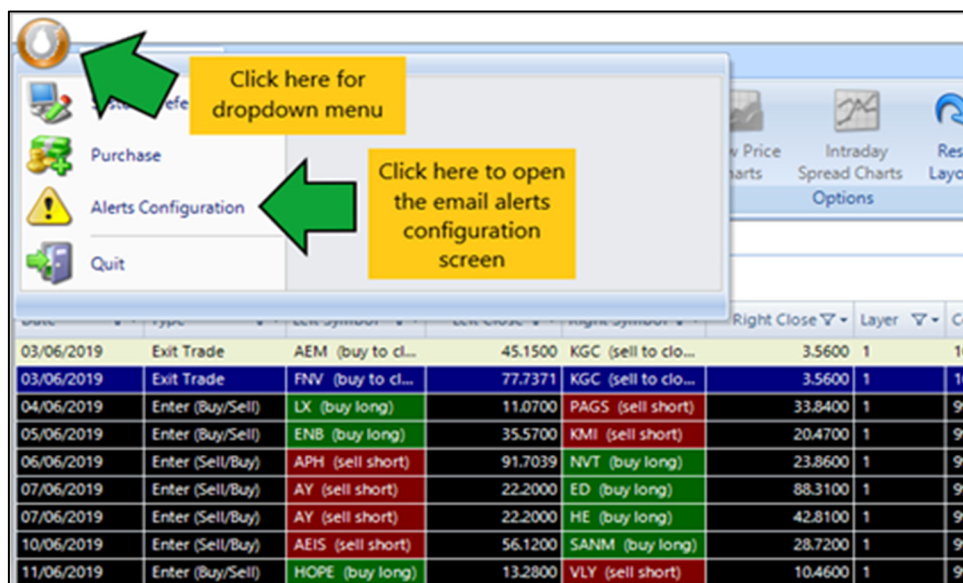
## 2.5 Setting Up Audio and Email Alerts

Trading signals for analysis and execution will come in during market hours (or during whichever period you have set the Intraday Update schedule). Instead of being glued to the trading signals window all session long, you can set PTF PRO to alert you to new trading signals via an audio beep and/or email.

To setup audio alerts, which is a beeping sound when a new trading signal arrives, please **click on the System Preferences** button on the front screen, then **enable the play sound options, which can be customised for each type of signal, click ok.**

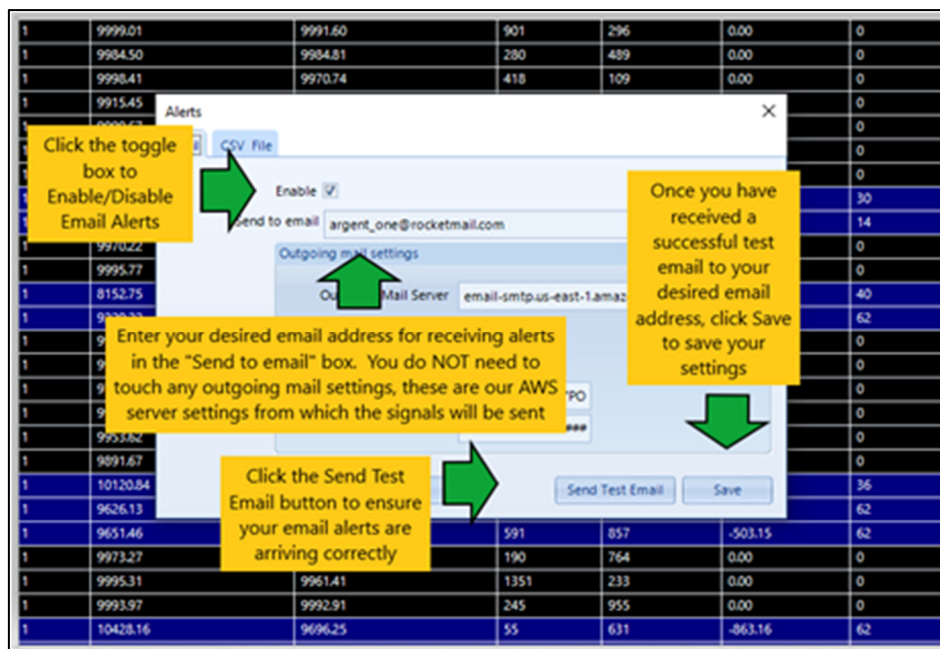


To setup email alerts, please **click on the pair logo** in the top left-hand corner of the software, then **click on Alerts Configuration.**

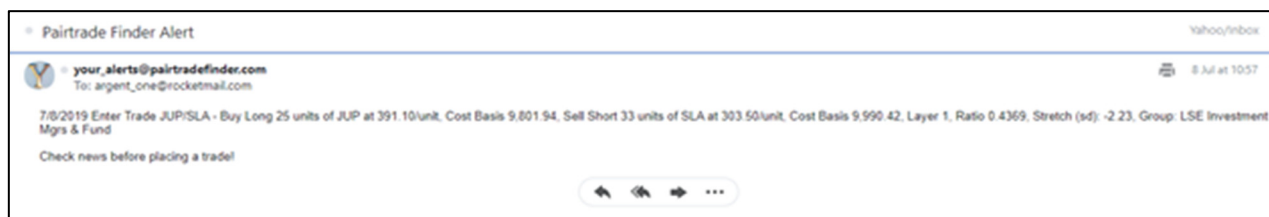




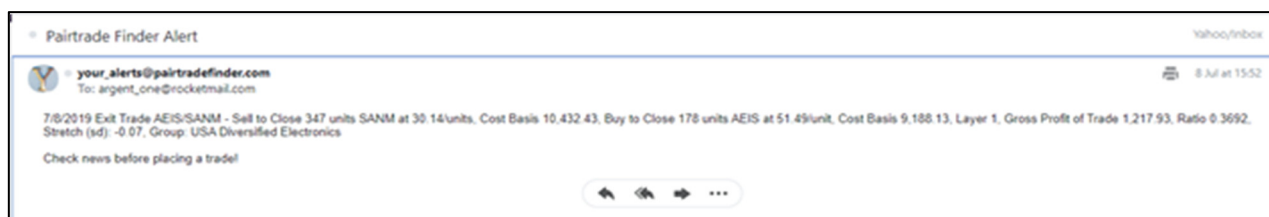
In the Alerts Configuration window, **click on the email tab** and follow instructions as shown in the screenshot below:



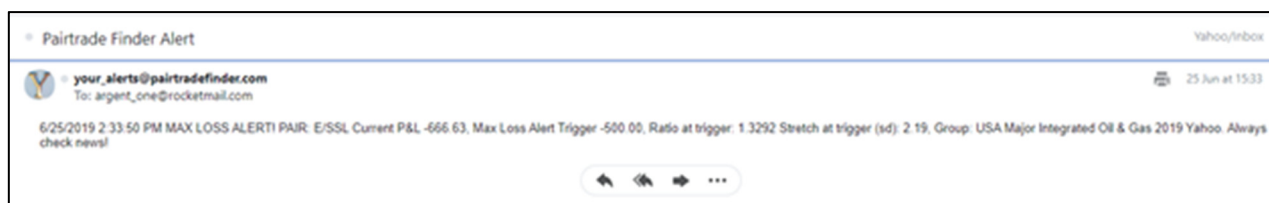
Below is an example of what an Entry trading signal sent to your inbox will look like:



Below is an example of what an Exit trading signal sent to your inbox will look like:



Below is an example of what a Max Loss Alert signal sent to your inbox will look like:



We highly recommend you setup at least audio alerts, and/or email alerts so you are notified in real-time when our software has generated a new trading signal for you to review, analyse and/or act upon.

## 2.6 Analysing Beyond the Trading Signals

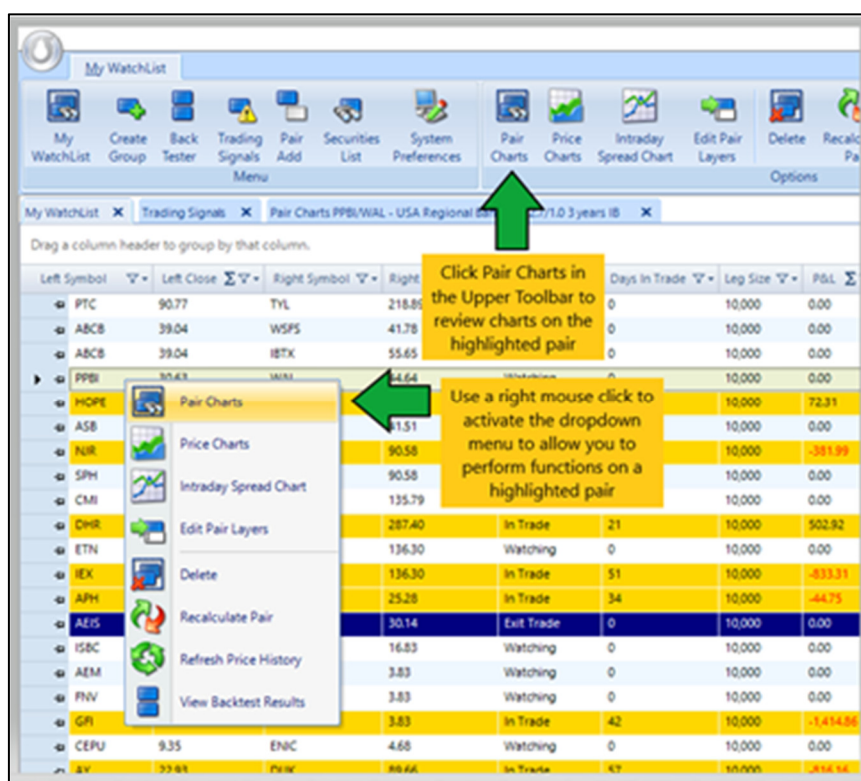
In addition to PTF PRO's built-in trading signals, you can further analyse any pair that has generated a signal to select only those signals which i) meet your additional trading plan criteria; ii) which are not the result of news which impacts long-term fundamental value; and iii) have an historical average Days In Trade value that is less than the current number of days until the next earnings releases and ex-dividend dates of each symbol in the pair.

Alternatively, you could trade every signal that is generated from My Watchlist pairs.

Whichever your approach, it should be grounded in rigorous back-testing, position-sizing discipline, and be developed from paper trading (or very small position size live trading) of your system to the point of confidence in its profitability and robustness.

Using the current PTF PRO default signal settings, trading signals are generated at 2.00 standard deviations from the 100 day mean of the core ratio, an exit signal is generated when the pair goes past 0.00 standard deviations ("sd"); i.e. it reverts fully back to the mean. These settings represent the most common settings used in academic research on pair trading and will generate reasonable frequent entry signals (on average about 3-4 per year per pair). The current sd reading on each pair is shown in the "# of Deviations from Mean" column in My Watchlist. Feel free to experiment with other Entry and Exit settings. Many professional pair traders like to use a 2.70 Entry stretch and a 1.0 Exit stretch, or, use Layers for entry. The wider you set the Entry stretch, by definition the less frequently the Entry signals will occur.

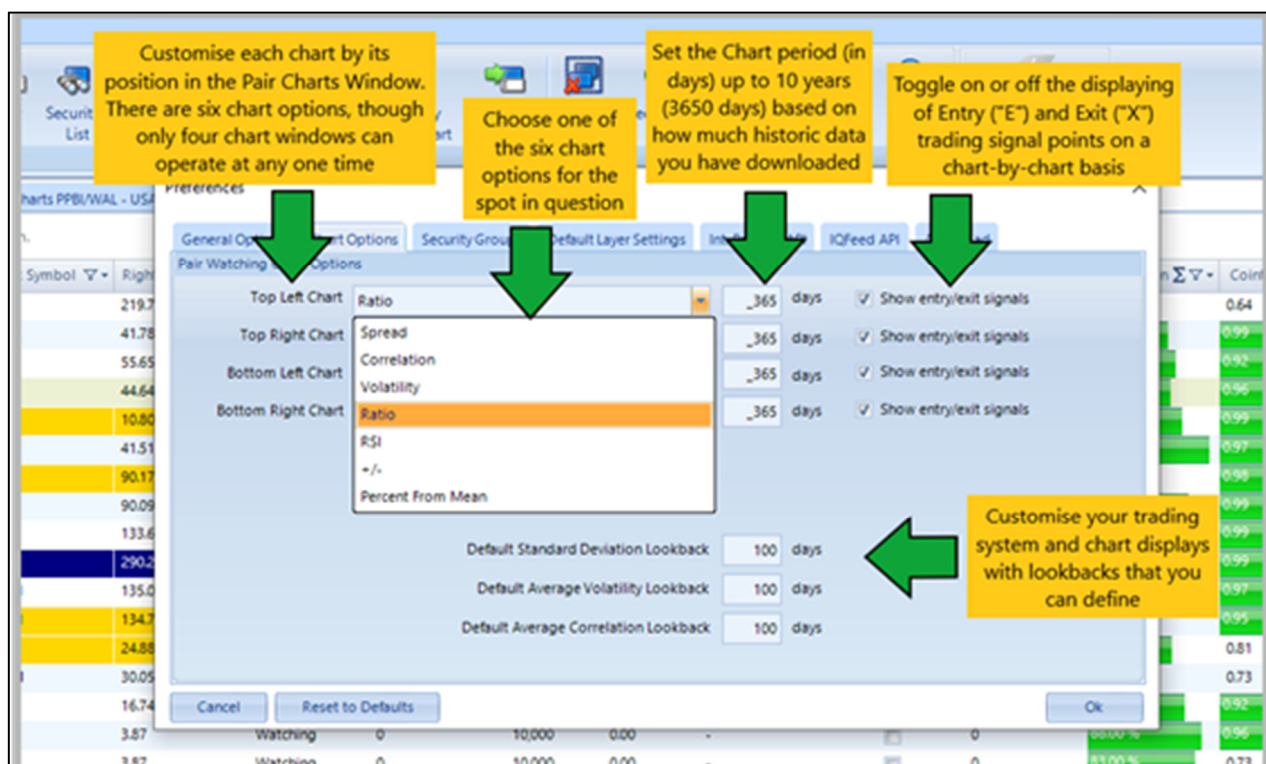
To analyse each pair further, you can select a pair in My Watchlist then click on the Pair Charts button. You can also use a right mouse click on the pair in My Watchlist and select Pair Charts from the resulting dropdown menu:



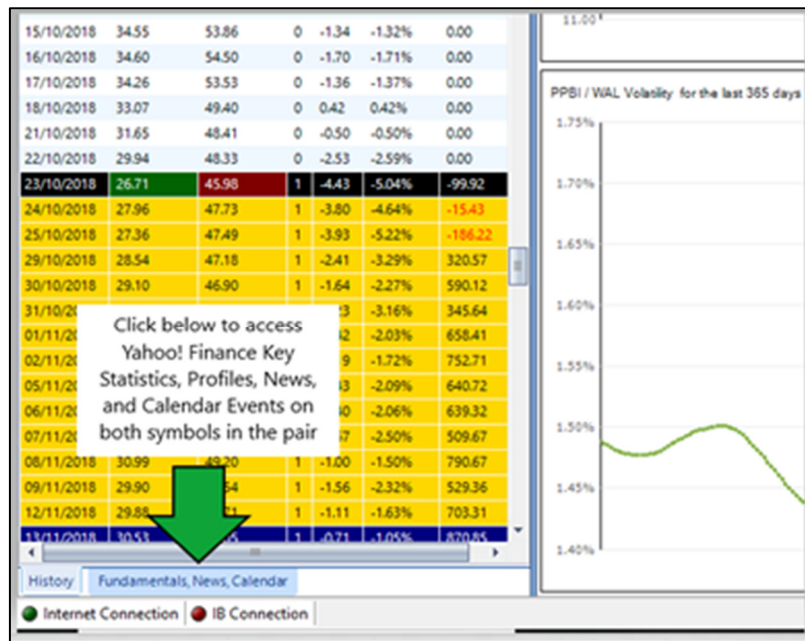
Below you can see the Pair Charts page and an explanation of the many elements contained therein:



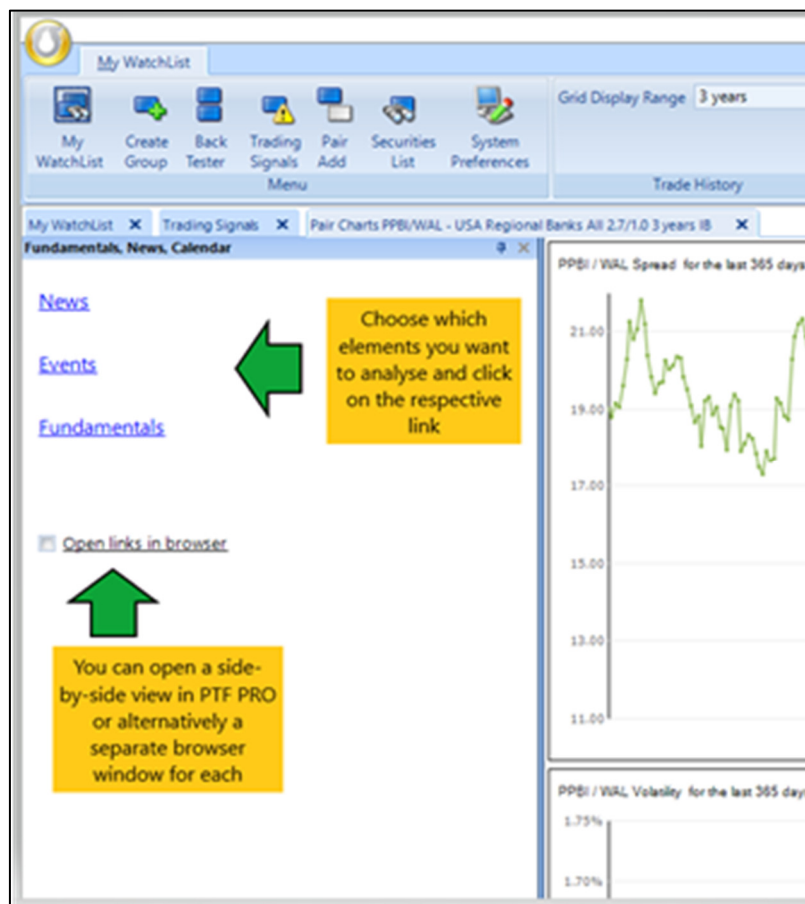
To customise your Pair Charts, go to System Preferences/Chart Options. There are six chart options for Pair Charts (though only four can be displayed concurrently): Spread, Correlation, Volatility, Ratio, RSI, +/-, and Percent from Mean. Chart periods on each can be set separately, and the display of Entry and Exit signal points on each chart can be toggled as well.



In the same Pair Charts window, you can easily compare the fundamentals of each stock against each other, **click on the Fundamentals, News and Calendar tab** at the bottom of the Trade History window:

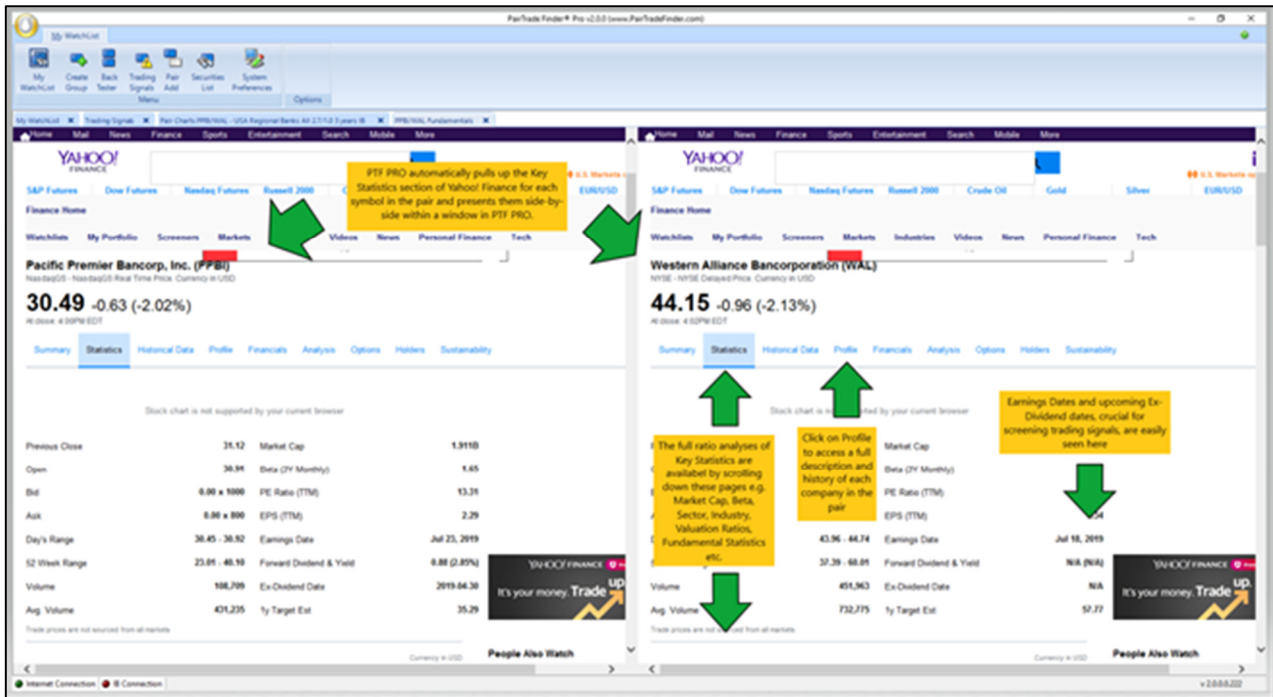


You can choose to review News Releases on each symbol in the pair, Calendar information from the Profile page in Yahoo! Finance and detailed Fundamentals information from Key Statistics:



Side-by-side view of the Fundamentals link:





PTF PRO automatically pulls up the Key Statistics section of Yahoo! Finance for each symbol in the pair and presents them side-by-side within a window in PTF PRO.

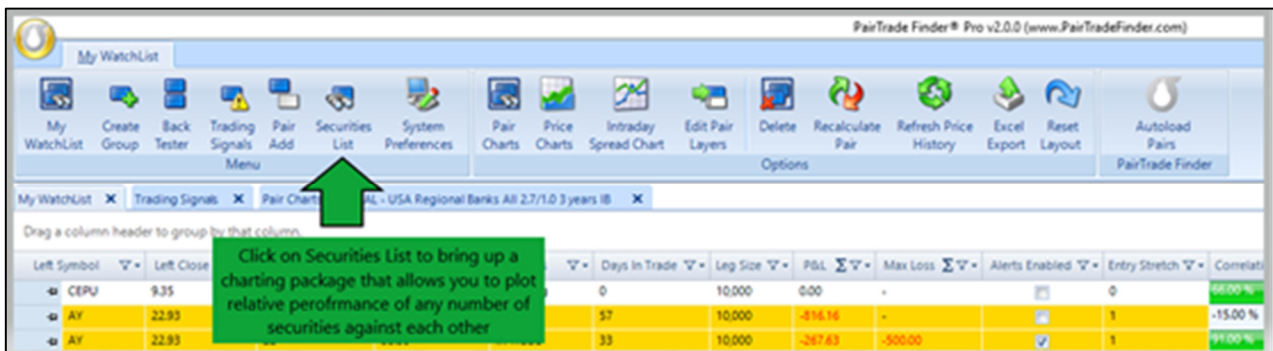
The full ratio analyses of Key Statistics are available by scrolling down these pages e.g. Market Cap, Beta, Sector, Industry, Valuation Ratios, Fundamental Statistics etc.

Click on Profile to access a full description and history of each company in the pair.

Earnings Dates and upcoming Ex-Dividend dates, crucial for screening trading signals, are easily seen here.

Symbol	Price	Change	% Change
Pacific Premier Bancorp, Inc. (PFB)	30.49	-0.63	(-2.02%)
Western Alliance Bancorporation (WAL)	44.15	-0.96	(-2.13%)

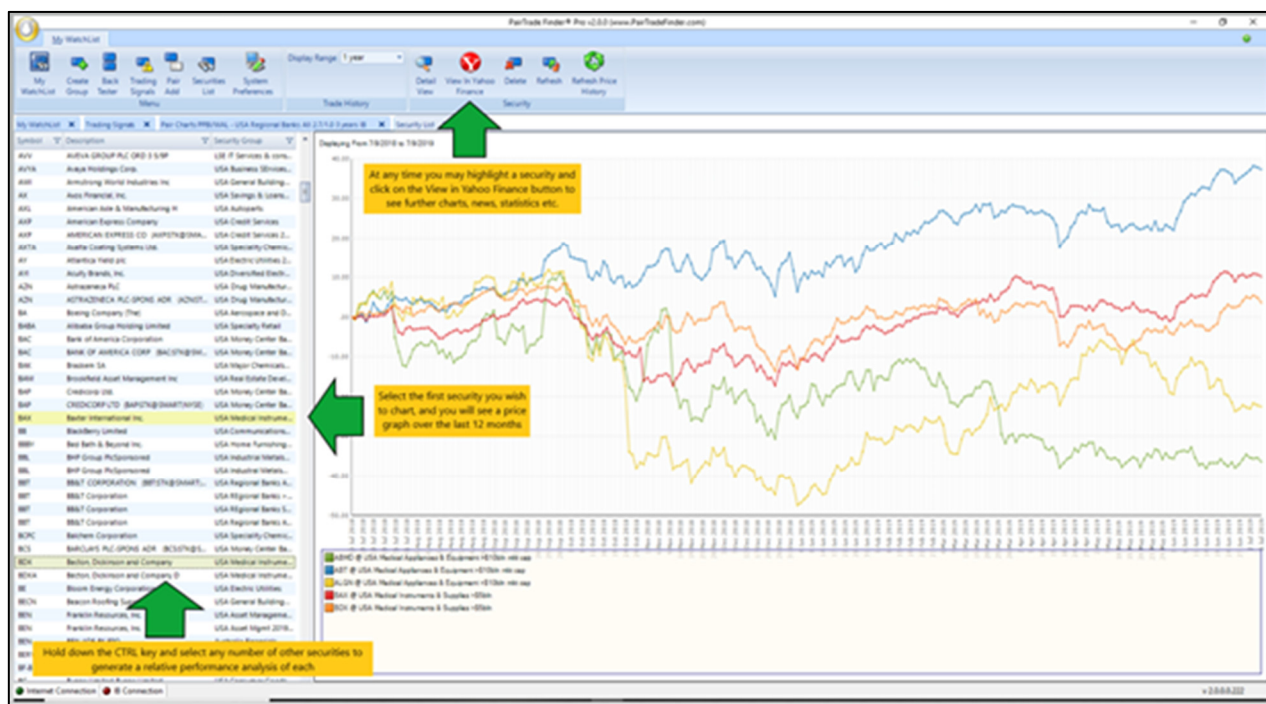
If you would like to compare any two or more securities relative performance against each other you can do so by clicking on the **Securities List** button on the main toolbar:



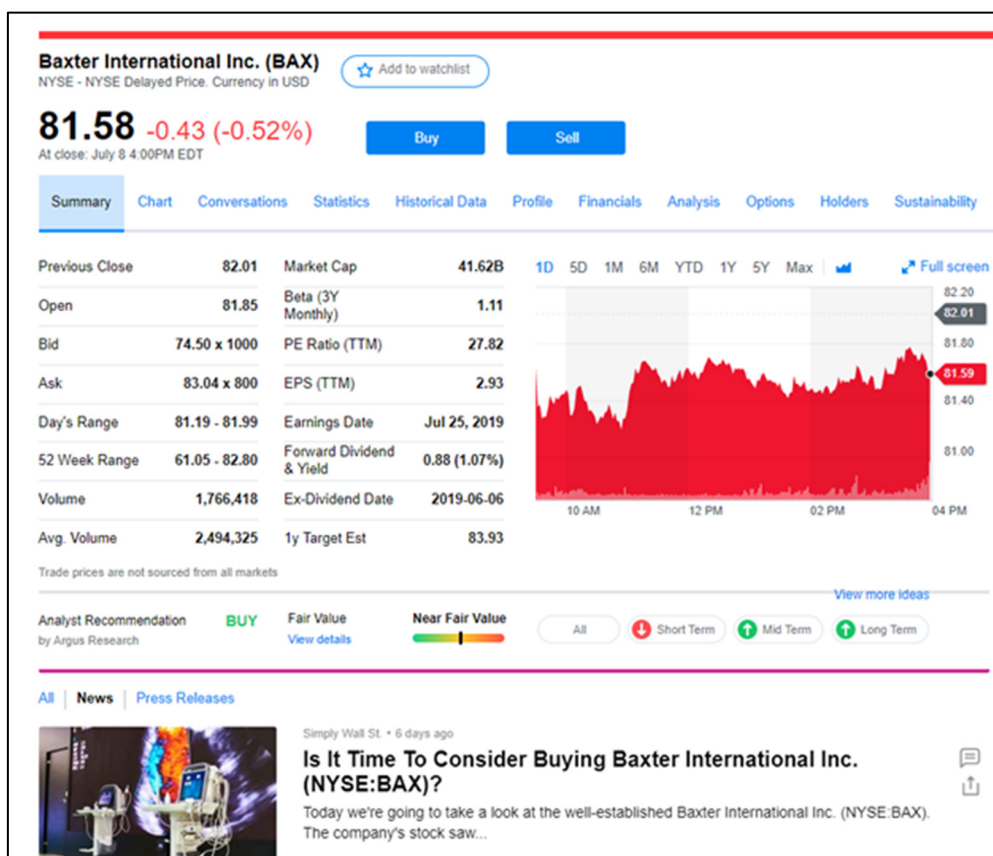
Click on Securities List to bring up a charting package that allows you to plot relative performance of any number of securities against each other.

Left Symbol	Left Close	Days in Trade	Log Size	P&L	Max Loss	Alerts Enabled	Entry Stretch	Correlate
CEPU	9.35	0	10,000	0.00	-	<input type="checkbox"/>	0	56.00%
AY	22.93	57	10,000	-816.16	-	<input type="checkbox"/>	1	-15.00%
AY	22.93	33	10,000	-267.63	-500.00	<input checked="" type="checkbox"/>	1	91.00%

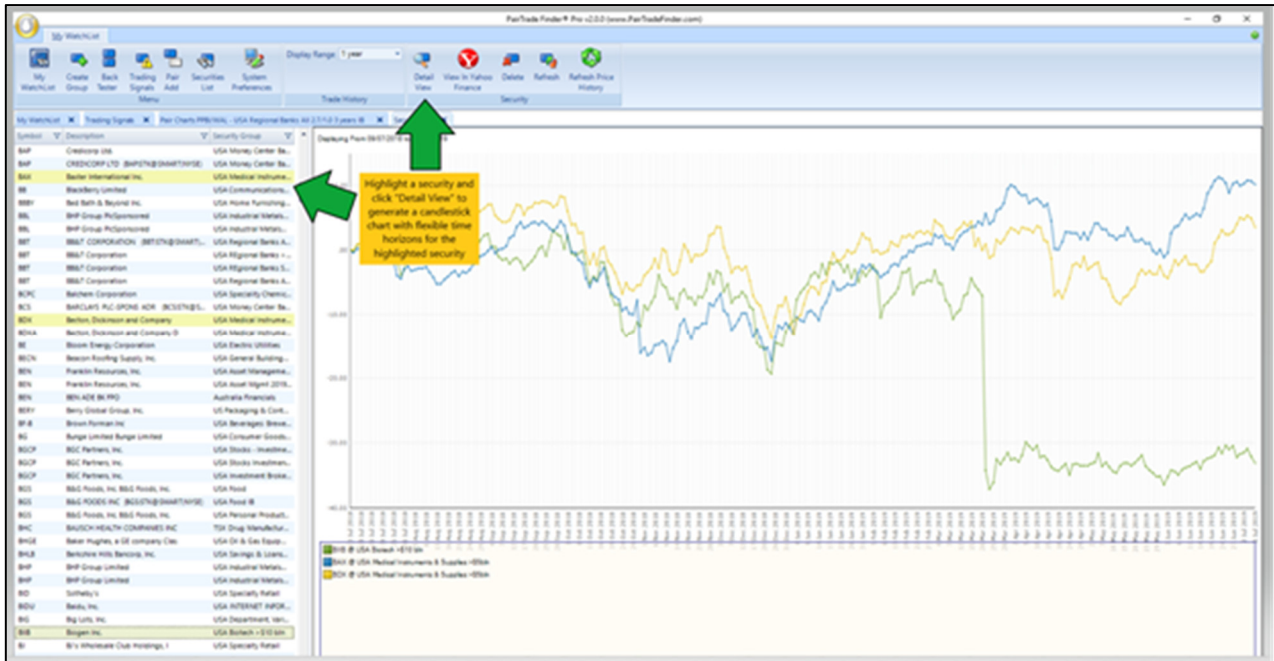
Next, select two or more securities using the CTRL key:



If you wish to see the latest news items released on a particular stock, click on it in the left-hand column, then **click on the View in Yahoo! Finance** button. Your browser will automatically load the selected security code in Yahoo! Finance, so you can quickly see charts, fundamentals, statistics, analyst opinions and any recent news items released on it:



If you wish to view an individual candlestick chart for a stock, please select a stock in the left-hand column, then **click on Detail View**.

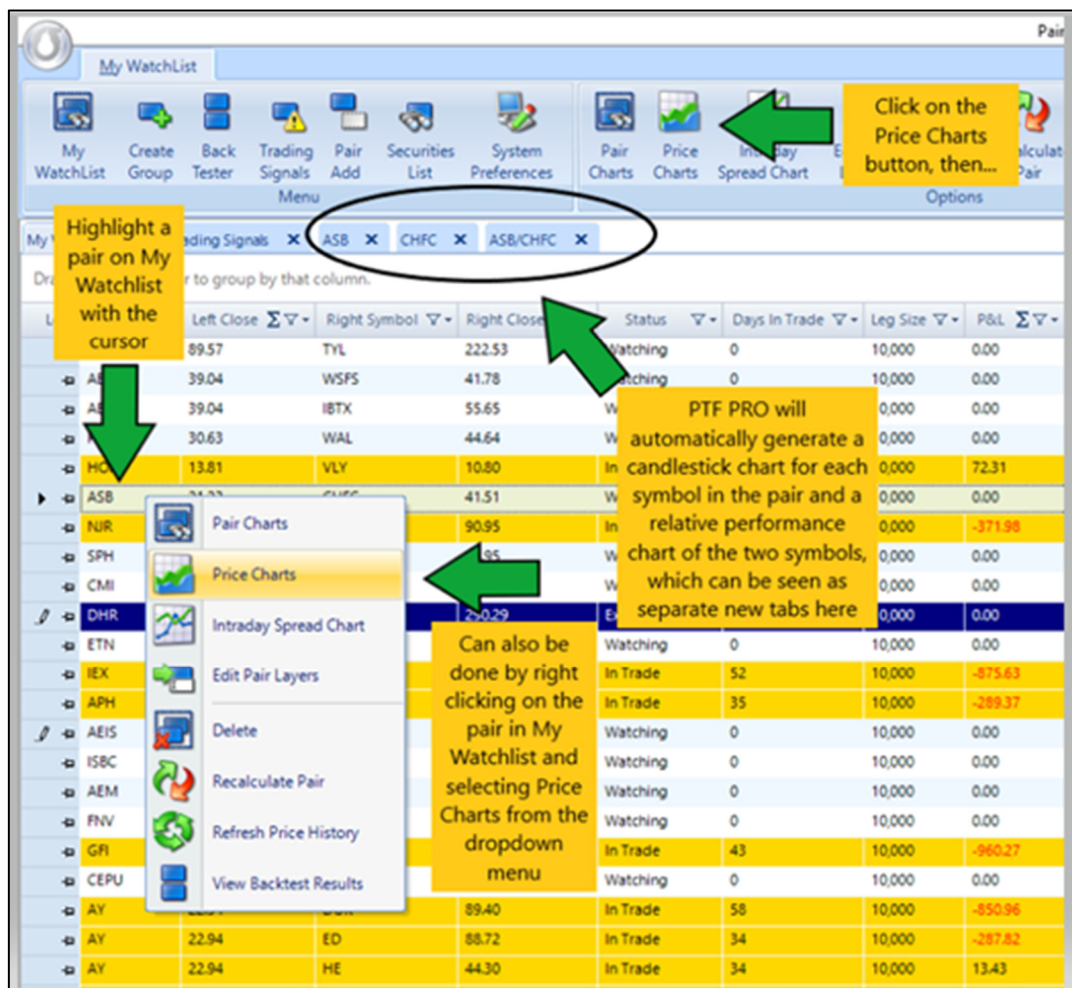


Next you will see the detailed view window, where you can analyse daily trading information, whether the stock is trending or ranging, view the most commonly used Exponential Moving Averages and look for key support/resistance levels:

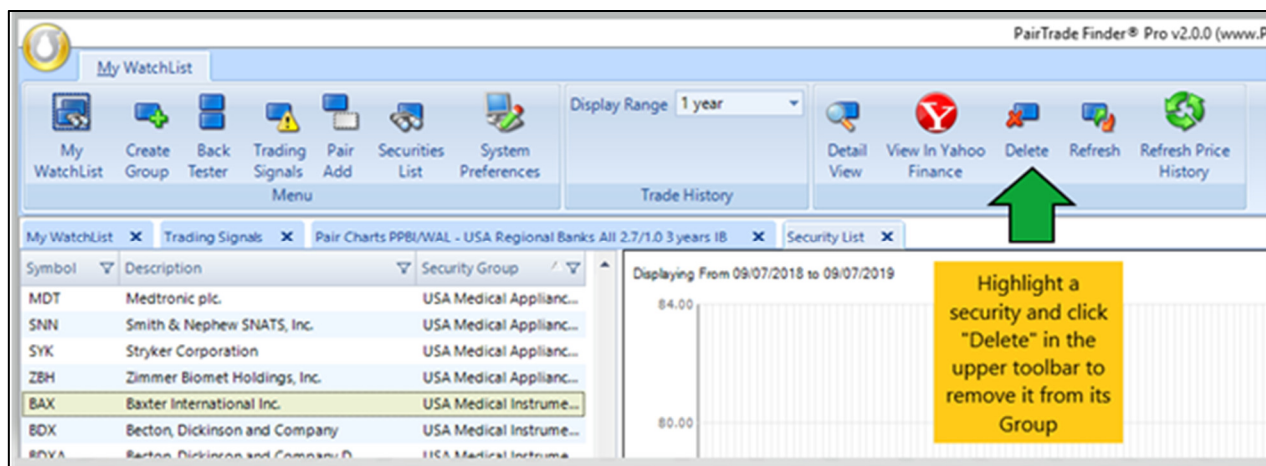




You can also activate from My Watchlist an expedited set of charts – an individual candlestick chart for each symbol in the pair and a relative performance chart of the two symbols – by highlighting the pair on My Watchlist and clicking on the Price Charts button on the upper toolbar or right mouse clicking on the pair and selecting Price Charts from the dropdown menu:

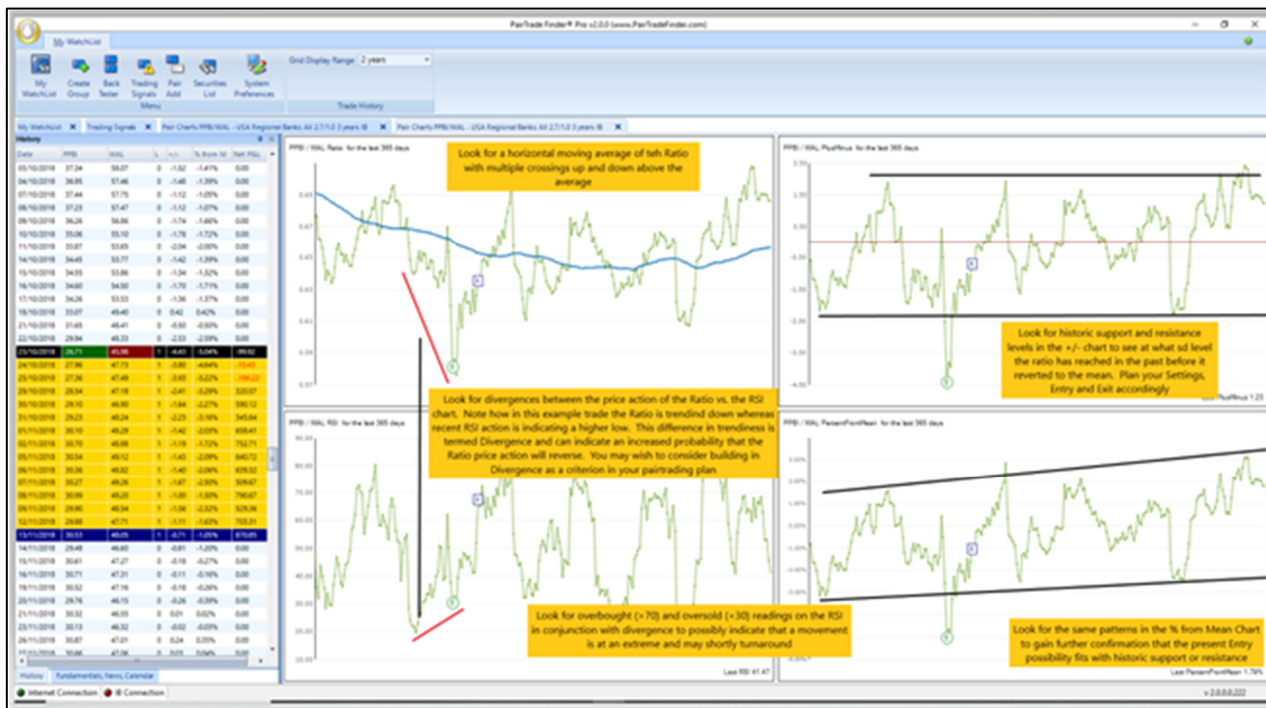


If you wish to delete a stock from a particular Group, select it in the left column in the Securities List tab and **click delete**:



## Important Tips on Interpreting the Pair Charts

Below is a screenshot with some tips for what to look for when analysing the pair charts. We urge you to feel free to devise your own interpretations and create your own custom trading rules:



The Ratio chart is probably the most used chart in pair trading, shown in the top left-hand corner in the above screenshot, it is the left stock in a pair divided by the right stock. In the above example, the latest ratio is 0.69. When the +/- column is showing a negative number, the ratio is below its mean, vice versa when the +/- column is showing a positive number. When we are betting on a rising ratio, we are betting on the left code outperforming the right code, i.e. long the left stock / short the right stock, and vice versa when we are betting on a falling ratio price.

In the above example of the RSI divergence between the ratio and the RSI price, you can see the ratio chart move lower but in the same period the RSI makes a higher low, indicating a divergence. We like to follow the direction of the RSI chart, so we would be bullish on the ratio, thus betting on the left code (PPBI) outperforming the right code (WAL).

Please don't be alarmed if this doesn't immediately make sense to you. We recommend reading the above information several times and if you have further questions, to watch our Trade of the Month videos on our blog at [www.blog.pairtradefinder.com](http://www.blog.pairtradefinder.com). Although finding and interpreting RSI divergence is not needed to use our system effectively, understanding how the ratio chart and RSI chart work together will help your pair trading.

Ideally the best trading signals occur on pairs with the best backtesting results and that are very stretched from their mean on no significant news items. For example, if the pair PPBI/WAL was 4.43 standard deviations and 5% away from its mean on no significant news items and with sufficient time before the next earnings releases and dividend dates, with the divergence as seen above, this set up presents a very good trading opportunity. Not every trade with a great setup may win, but out of 10 or more of these trades, you will likely come out on top.

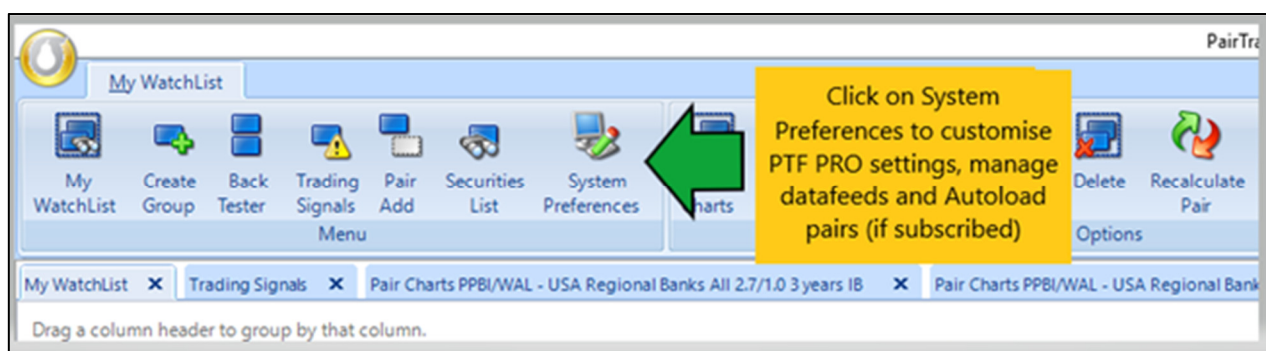


The best way to get good at pair trading is the same way to get good at anything else; read, learn, practice, persist, be patient, then practice some more. You will get better at identifying the highest probability setups and you will find your trading nirvana. Pair trading can be the vehicle that will get you there, as it has for many traders since the early 1900s. It is ultimately up to you, the trader, as to whether you will make it succeed for you or not.

## 2.7 Customizing Your Own Trading System

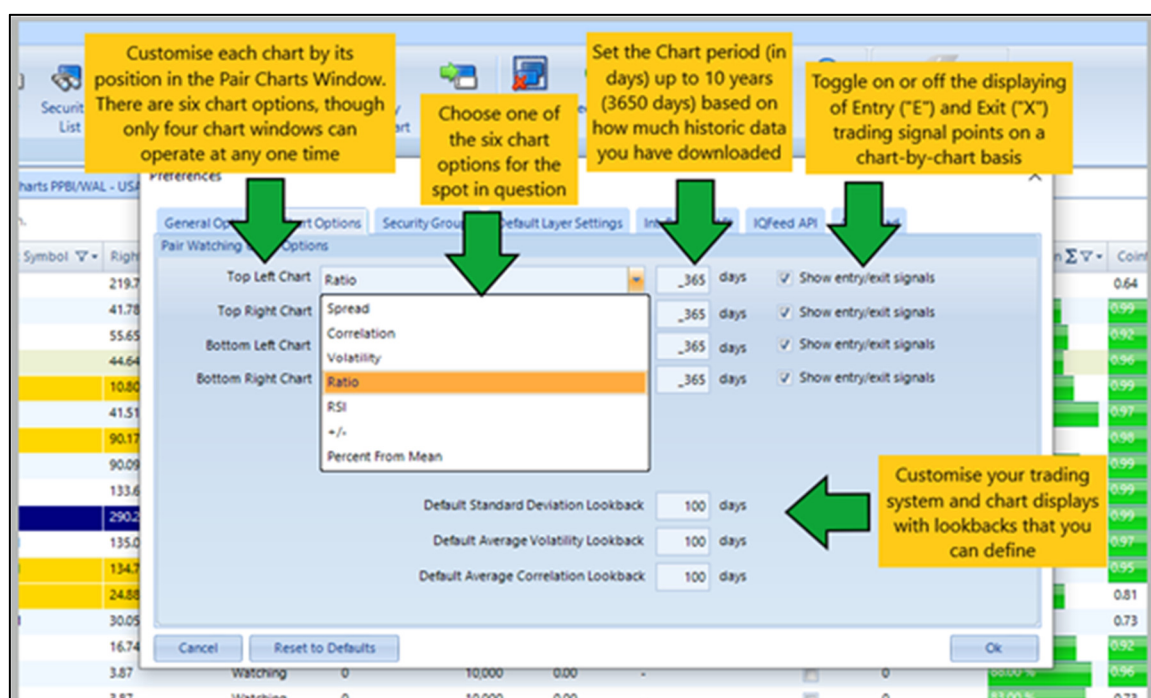
PTF PRO is designed to be highly customizable, flexible and appealing to a wide audience of traders. Accordingly, traders can customize how the charts are shown in the Pair Charts window, how trading signals are generated, how trading parameters are calculated, how semi-autotrade order types are sent and more.

To change the chart settings, go to My Watchlist, then please **click on System Preferences**:



As we outlined above in Pair Charts, if you click on **the Chart Options tab under Systems Preferences**, you can choose:

1. which charts are shown where (up to six different option, though only four can display concurrently), including Spread, Correlation, Volatility, Ratio, RSI, +/-, and Percent from Mean)
2. which lookback period to use for each of Correlation, Volatility and Standard Deviation (RSI Lookback is set in Group Settings for each Group)
3. the chart time period (up to 10 years, based on how much historic data you have retrieved)
4. and whether to show Entry and Exit trading signal points on a chart-by-chart basis



You can also fully customise how the signals are generated for each individual Group you create. To edit the default parameters that will automatically populate every time you click on "Create Group" on the main toolbar, **click on System Preferences**, then the **Securities Groups** tab. On the right-hand side of this box you will see the default Group settings. Please refer to the below screenshot for definitions of each parameter:

The screenshot shows the 'Default Group Settings' dialog box in the PairTrade Finder PRO software. The dialog is divided into several sections with various input fields and dropdown menus. Green arrows point from yellow callout boxes to specific settings:

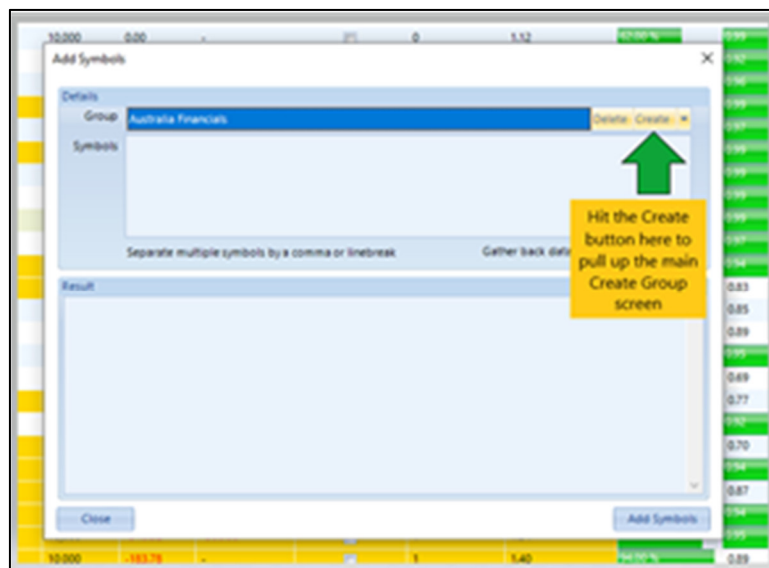
- Ratio and Stretch Lookbacks:** Point to 'Ratio Lookback' (100 days) and 'Stretch Lookback' (100 days). Callout: "Ratio and Stretch Lookbacks refer to how far back the stdev measures are applied to the avg mean. Keep both these figures the same".
- Backtest Lookback Period:** Points to 'Backtest lookback period' (3 years). Callout: "Use this box to set the default backtest lookback period i.e. over how long a time you want of backtest the pair for signals".
- Standard Deviation Lookback:** Points to 'Standard Deviation Lookback' (100 days). Callout: "Use this screen to set the Default Group backtest and signal parameters. These settings will automatically populate when you use the Create Group toolbar button".
- Maximum Days in Trade:** Points to 'Maximum Days in Trade' (60 days). Callout: "This is how many days the software measures standard deviation of the Core Ratio. Lower numbers are more sensitive to changes in volatility".
- Exit Stretch:** Points to 'Exit Stretch' (0.00). Callout: "This box sets your default Exit Stretch for exiting a trade (i.e. the sd value at which PTF PRO will create an Exit signal)".
- Maximum Active Trades:** Points to 'Maximum Active Trades' (0). Callout: "This box specifies your time stop for a trade".
- Commission/Slippage:** Points to 'Commission/Slippage' (0.25 % of Transaction Value). Callout: "Sets the maximum number of Active trades for a Group after which PTF PRO will nto call signals **NB: No longer activated in PRO v2.0. Set at 99 as default**".
- Backtest Lookback Period:** Points to 'Backtest lookback period' (3 years). Callout: "Sets the lookback period for the RSI calculations for both RSI charts and RSI trade signal filter".
- Default Relative Strength Index (RSI) Lookback:** Points to 'Default Relative Strength Index (RSI) Lookback' (14 days).

The background shows a table of securities with columns for Days In Trade, Leg Size, Spread, Ratio, and Core Ratio.

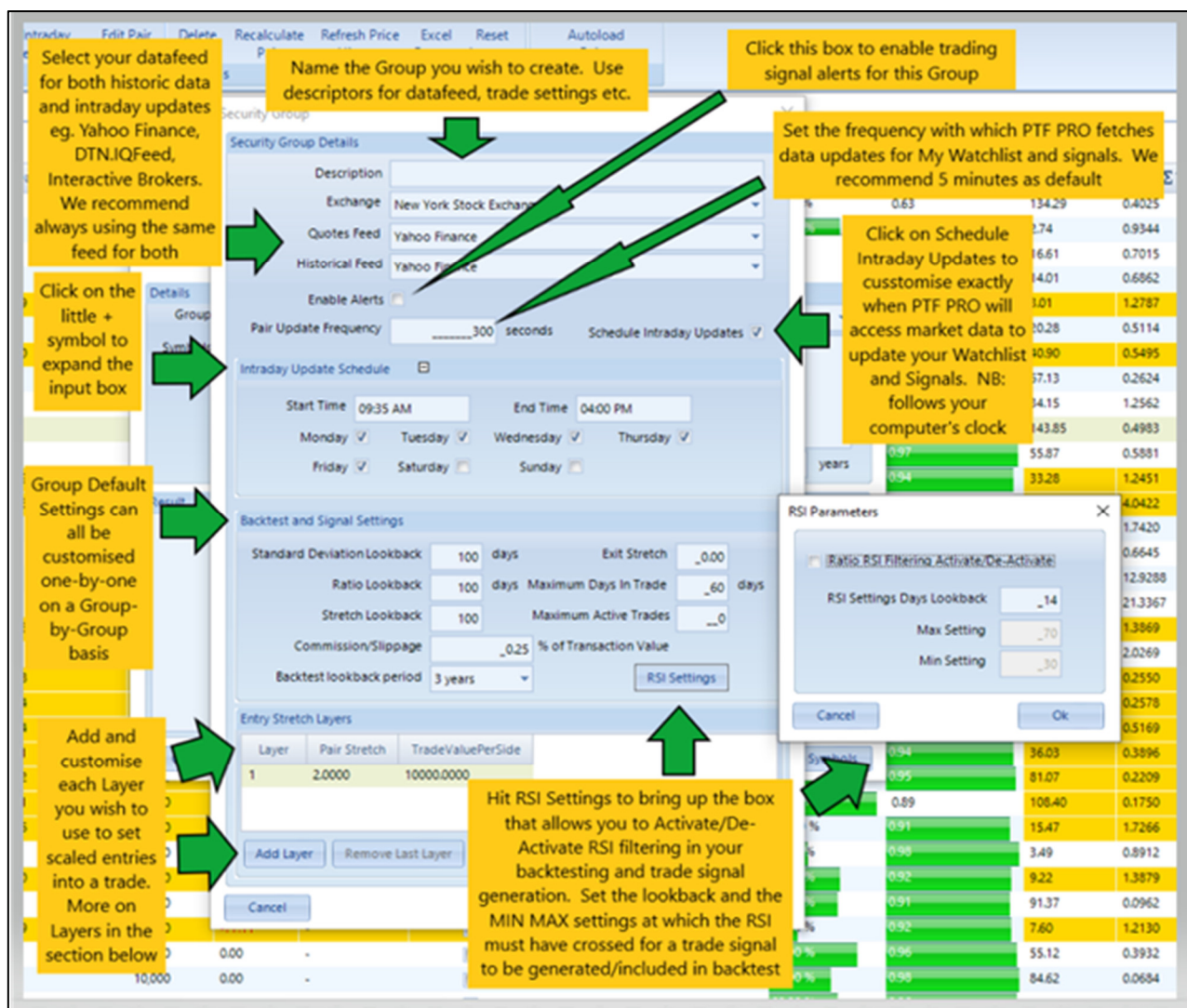
With these Default Group Settings in place, we can now show how to customise PTF PRO's settings and trading parameters further. Go to the main toolbar and click the Create Group button.

The screenshot shows the main toolbar of the PairTrade Finder PRO software. A green arrow points to the 'Create Group' button. A yellow callout box says: "Hit the Create Group button to get started". The toolbar includes buttons for 'My WatchList', 'Create Group', 'Back Tester', 'Trading Signals', 'Pair Add', 'Securities List', 'System Preferences', 'Pair Charts', 'Price Charts', and 'Intraday Spread Chart'. Below the toolbar is a table of securities with columns for Left Symbol, Right Symbol, Right Close, Status, and Days In Trade.

Then hit the Create button in the upper right:



This button pulls up the main Create Group screen. The screenshot below shows you the meaning and customisability of each of the elements on this very important screen:





## 2.8 Customizing and Using Entry Levels in PairTrade Finder® PRO

To modify the entry trigger level, that is, how many standard deviations a pair must be away from its mean before our software generates an Enter Trade signal, please click on Edit Layer as outlined in the screenshot below. You will see the Edit Layer screen appear:



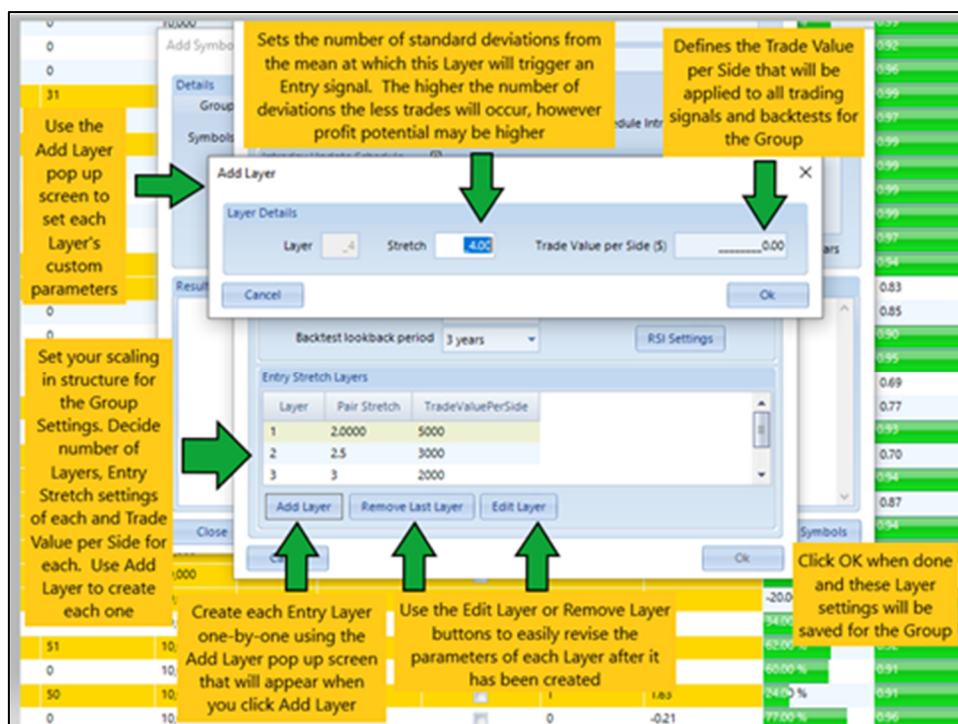
If you are only using one entry layer, input this as Layer 1, assign it an entry stretch level, and input your preferred Trade Value per Side. By default, PTF PRO generates entry signals when the pair is 2.00 standard deviations ("sd") from the mean. You can change this to 2.50 sd, 2.70 sd or whichever level you find most appropriate for your trading style.

As a powerful customisation feature to allow you to scale-in to your pair trades, you can also add additional Entry Layers to the system, that is, have additional entry signals in the same pair if it keeps on moving away from the mean. For example, you could setup Layer 1 at 2.00 sd, Layer 2 at 2.50 sd, and a Layer 3 at 3.00 sd so you can scale-in to your trade to improve your Entry Stretch "cost" average. Layering is only recommended for experienced pair traders.

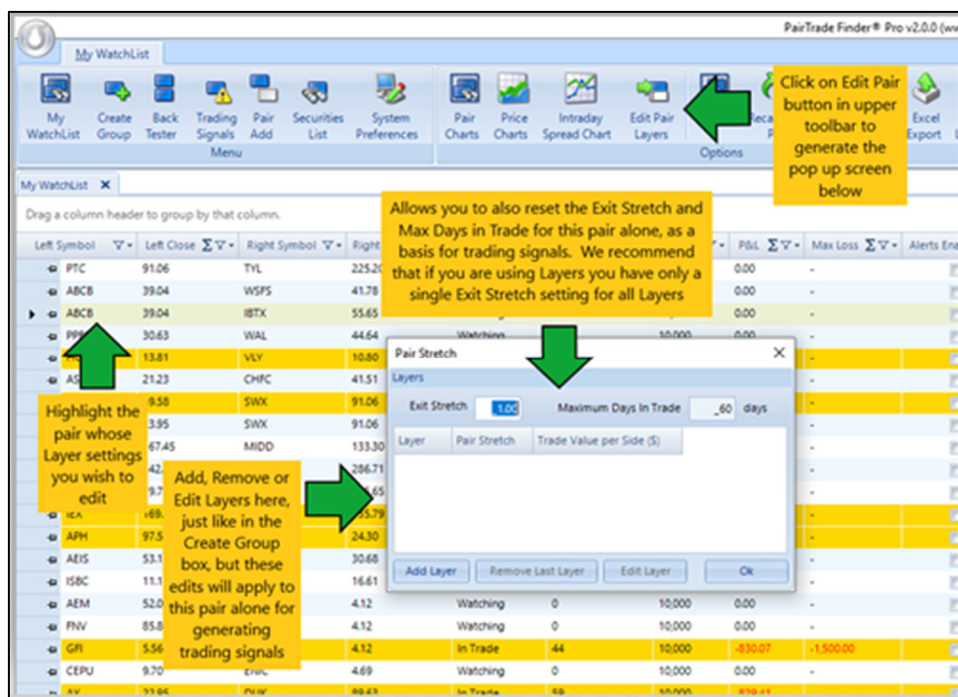
For a detailed discussion of Layering, how it is done, and its Pros and Cons, please see our video on this topic here: <https://www.youtube.com/watch?v=9YPjHMDt-4>



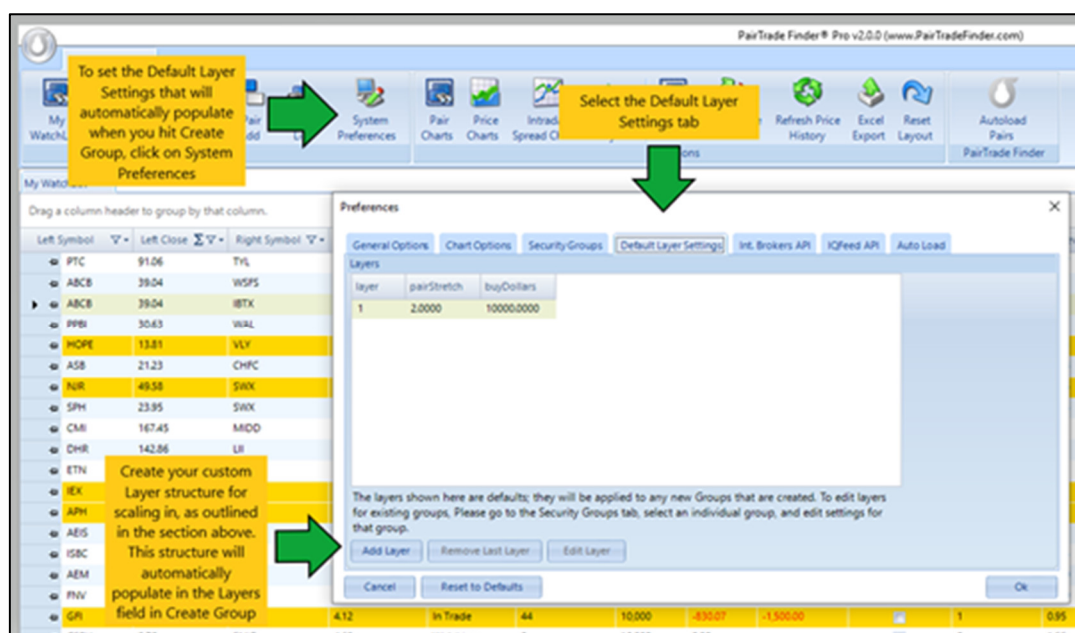
The screenshot below will show you how to add various layers to your Group Settings, with custom Trade Values per Side for each Layer:



You may wish to set individual entry layers for each pair, for e.g. for two highly correlated, liquid ETFs you may want to set a 2.00 sd layer. However, for a risky small cap NASDAQ biotechnology pair you want may to use 3.00 sd along with smaller position sizing. To edit individual layers for pairs, go to the My Watchlist screen, select a pair, and then **click on Edit Pair Layers**:



To set the Default Layer Settings so that you can input a custom scaling-in structure that will automatically populate in the Layers field every time you use Create Group, go to System Preferences/Default Layer Settings where this customisation can be created:

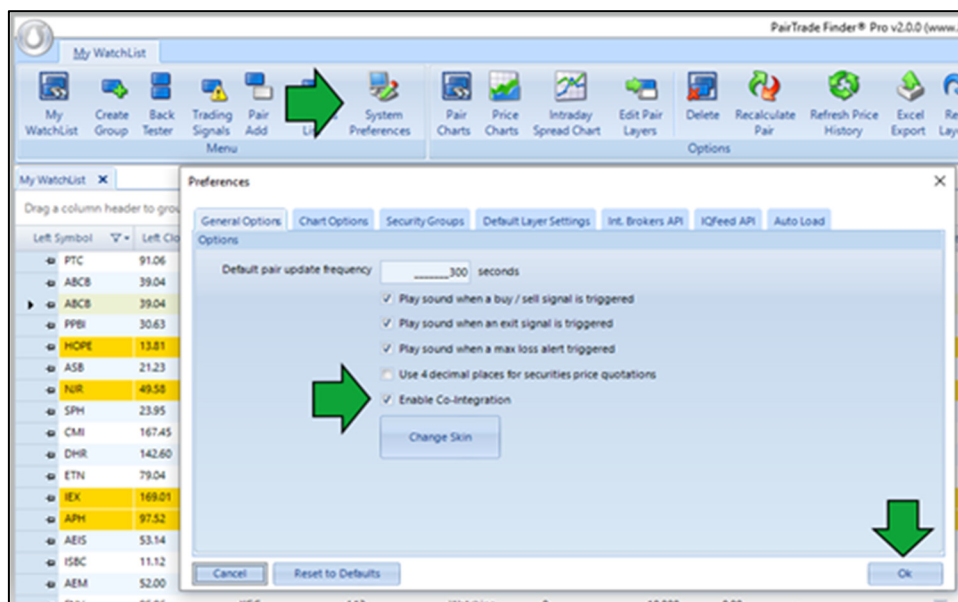


As you can see, PTF PRO is highly customisable and its unlikely two traders will execute exactly the same trades over time. You can use and customize PTF PRO in any way you can imagine. Some traders can get very creative with their trading rules and combinations, others swear by the RSI chart, others buy the dips in up-trending ratio charts backed with fundamentals, some will only trade pairs in a certain industry etc. It really is up to your imagination as to what you can devise and backtest for profitability and robustness.

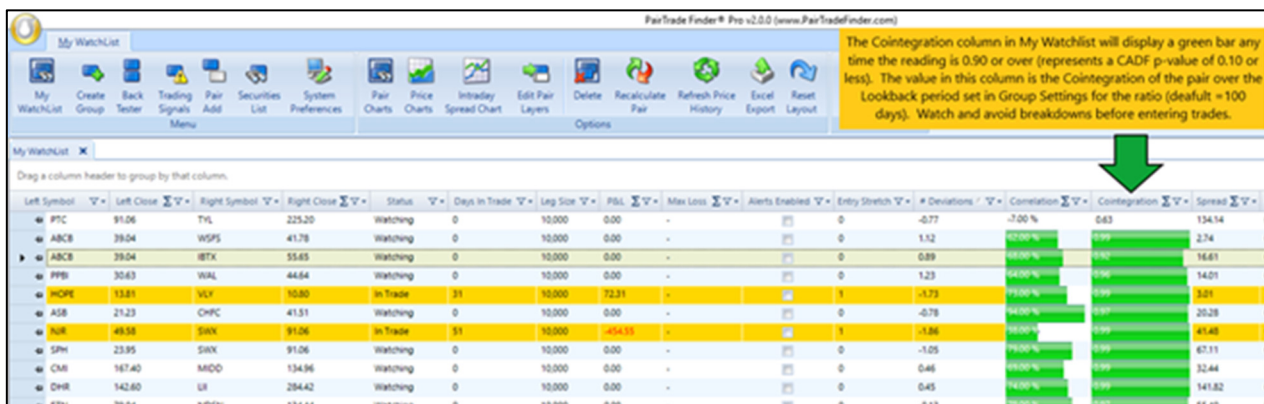
Pair trading is part science, part art. It is a skill that you can grow and develop over time. Before you know it, your trading will come naturally to you just like driving a car or riding a bicycle.

## 2.9 Using Co-integration with PTF PRO

One of the most powerful features of PairTrade Finder® PRO is the ability to calculate and monitor Cointegration for backtested and My Watchlist pairs. You can enable the Cointegration function in System Preferences/General Options, just check the box:



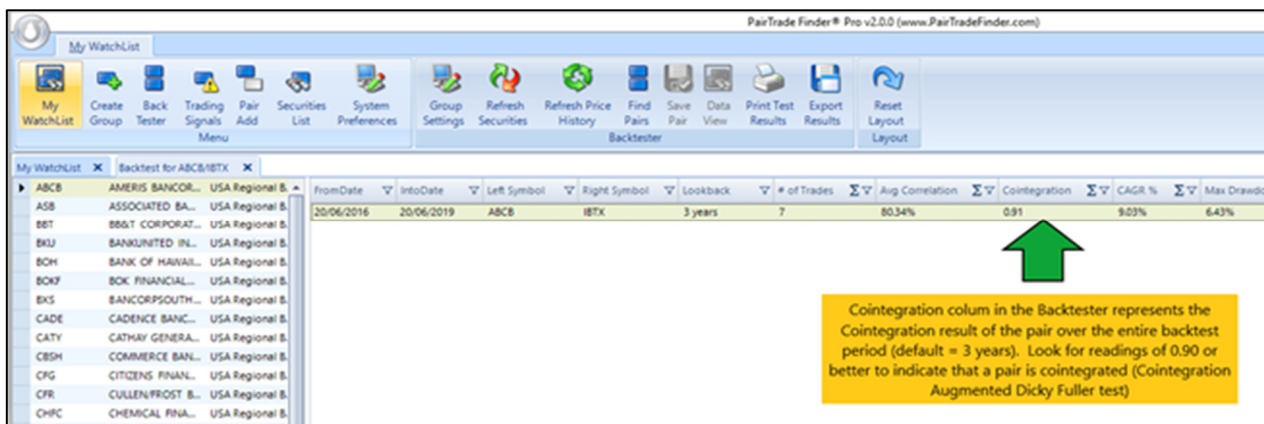
Once you check the box there will be a column in My Watchlist titled Cointegration:



The Cointegration column in My Watchlist will display a green bar any time the reading is 0.90 or over (represents a CADF p-value of 0.10 or less). The value in this column is the Cointegration of the pair over the Lookback period set in Group Settings for the ratio (default = 100 days). Watch and avoid breakdowns before entering trades.

Left Symbol	Left Close	Right Symbol	Right Close	Status	Days In Trade	Leg Size	P&L	Max Loss	Alerts Enabled	Entry Stretch	# Deviations	Correlation	Cointegration	Spread
PTC	91.06	TYL	225.20	Watching	0	10,000	0.00	-		0	-0.77	-7.00 %	0.63	134.34
ABCB	39.04	WSPS	41.78	Watching	0	10,000	0.00	-		0	1.12	57.00 %	0.99	2.74
ABCB	39.04	IBTX	55.65	Watching	0	10,000	0.00	-		0	0.89	68.00 %	0.94	16.61
PPBI	30.63	WAL	44.64	Watching	0	10,000	0.00	-		0	1.23	64.00 %	0.99	14.01
HOPE	13.81	VLY	10.80	In Trade	31	10,000	72.31	-		1	-1.73	79.00 %	0.99	5.81
ASB	21.23	CHFC	41.51	Watching	0	10,000	0.00	-		0	-0.78	94.00 %	0.99	20.28
NIR	49.58	SWK	91.06	In Trade	51	10,000	-454.55	-		1	-1.86	96.00 %	0.99	41.48
SPH	23.95	SWK	91.06	Watching	0	10,000	0.00	-		0	-1.05	79.00 %	0.99	67.11
CMH	167.45	MDD	134.96	Watching	0	10,000	0.00	-		0	0.46	69.00 %	0.99	32.44
DHR	142.60	LI	294.42	Watching	0	10,000	0.00	-		0	0.45	74.00 %	0.99	141.82
FTS	79.66	NFTY	116.68	Watching	0	10,000	0.00	-		0	0.11	71.00 %	0.99	45.60

And in the Backtester for initial pair selection:



Cointegration column in the Backtester represents the Cointegration result of the pair over the entire backtest period (default = 3 years). Look for readings of 0.90 or better to indicate that a pair is cointegrated (Cointegration Augmented Dickey Fuller test)

From Date	To Date	Left Symbol	Right Symbol	Lookback	# of Trades	Avg Correlation	Cointegration	CAGR %	Max Drawdown
20/06/2016	20/06/2019	ABCB	IBTX	3 years	7	80.34%	0.91	9.03%	-6.43%

Below we will give you an explanation of Cointegration, why it's important in pair trading and how to use it with PairTrade Finder® PRO.

In essence, cointegration measures the tendency for a pair to revert back to its mean i.e. how often it will coverage back to its moving average after diverging. This metric is a superior measure of a relationship of two securities' prices for pair trading compared with correlation. Correlation only measures the similarity in movement between two stocks or other instruments, not whether their pair is mean-reverting. Mean reversion in pair trading means profits.

Cointegration measurement in PTF PRO is shown as a value between 0.01 – 0.99. We use the Cointegrated Augmented Dicky Fuller ("CADF") test for our trading purposes as we are trading the relationship of only two securities at any given time. More detail on this test can be found here:

<https://www.quantstart.com/articles/Cointegrated-Augmented-Dickey-Fuller-Test-for-Pairs-Trading-Evaluation-in-R>

Instead of getting too deeply into the statistical mathematics, all you need to know is this: with PTF PRO, ideally you want to trade pairs with a cointegration reading above 0.90. This reading means there is a greater chance the symbols' ratio will mean-revert and our trading signals will produce a profit.

**NB:** We take the *p*-value resulting from the CADF test and subtract it from 1 to produce our measurement. Hence a CADF *p*-value of 0.05 would display in PTF PRO as 0.95. Many of our users find this transposition intuitively helpful.

The amount of data you load when setting up a backtest for each instrument is what PairTrade Finder® PRO uses to calculate cointegration. We find measuring as much data as possible is optimal for finding true long-term, mean-reverting pairs.

Remember to rotate your pairs on My Watchlist so you are regularly deleting low cointegration pairs and looking for and adding high cointegration pairs.

This criterion is the most important measure for finding suitable pairs to trade.

As far as we are aware, PairTrade Finder® PRO is the only application available on the internet that accurately calculates cointegration in real-time on over 1,000,000 different trading instruments on 126 markets in 20 countries, with 1-click, semi-autotrading ability. This capacity of PTF PRO levels the playing field between hedge funds and online traders by giving you access to the same type of information used by professional hedge fund managers.

For an excellent research study that demonstrates the profitability of a cointegration-based pair selection strategy on the S&P500, peruse our Pair Trading Resources on our blog here: <https://blog.pairtradefinder.com/pair-trading-resources/> and look for a study titled: *Pairs trading and selection methods: Is cointegration superior?*



## 2.10 Autoloading PairTrade Finder® Top 30 US Equities Pairs

As of the date of writing of this Manual, Event Driven Investor Ltd., the publisher of PairTrade Finder® PRO software, also offers its own curated Top 30 US Equities Pairs as a separate subscription or as a promotional offer to new subscribers to our software.

These pairs, developed over thousands of hours by our team and updated every 2-3 months or so, are available to be Autoloaded into PTF PRO when you first open the program after signing up for a free trial or subscribing. Each stock pair we select for the Top 30 must meet stringent selection and return hurdles and pass a basic fundamental screening (using Yahoo! Finance historic data and Adjusted Close Price) as follows:

### Sample Selection:

- NYSE/AMEX/NASDAQ > \$1 bln mkt cap (most greater than \$3bln), > \$2m/day of avg. daily traded volume(\$), easy-to-borrow
- Broadly similar fundamentals, same national market, same sector, usually same industry sub group. Preference for beta-neutral, market-cap-neutral pairs, though this neutrality is not always possible
- Backtested over TWO OR THREE YEARS with a 2.0 Entry Stretch, 0.0 Exit Stretch, \$10,000/leg, no RSI Filter applied. 0.25% Commissions/Slippage per trade. 60 days Max Days in Trade, 100-Day Lookbacks

### Target Results:

- Target Cointegration of  $\geq 0.90$
- Target Compound Annual Growth Rate of Net Profits > 12.5% p.a. on a self-financing basis (i.e. before leverage), and in excess of Maximum Drawdown %
- Minimum Win Rate at least 67%, target of > 75%
- Target Correlation of > approx. 50%, lower can be tolerated if pair is highly cointegrated and meets all other criteria
- Total Commissions/Slippage < 20% of Gross Profit

Please Note: The example US Equities Pairs in PairTrade Finder® Pro are provided for informational and educational purposes only and the signals resulting therefrom should not be construed as personalized investment or trading advice. It should not be assumed that trading using the signals and parameters demonstrated by the Software will be profitable and will not result in losses. All signals are illustrative, based on a general portfolio size, and are provided solely for further user analysis. As markets evolve over time, we provide no warranty that the pairs provided will continue to meet the original selection criteria.

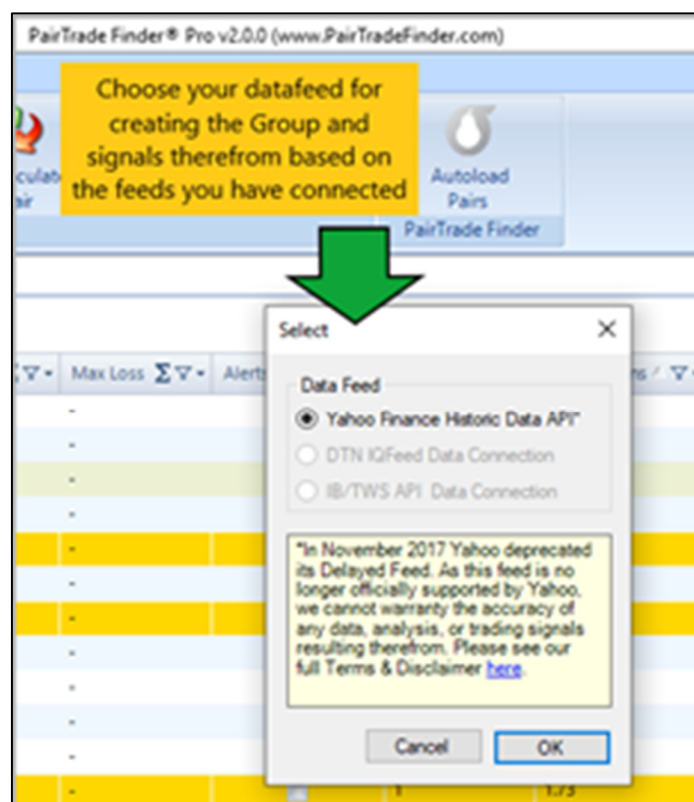


To Autoload the Top 30 US Equities Pairs on your initial bootup of PTF PRO, simply click on the Autoload Pairs button in the Upper Toolbar on My Watchlist page:

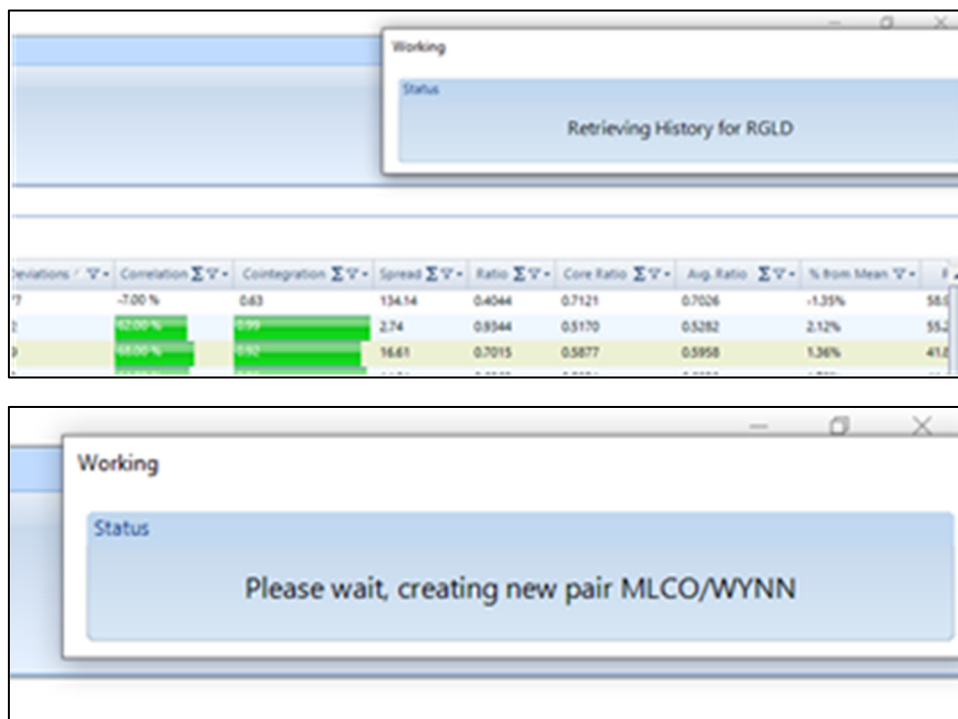


The Autoload tab can also be accessed at any time through System Preferences/Autoload.

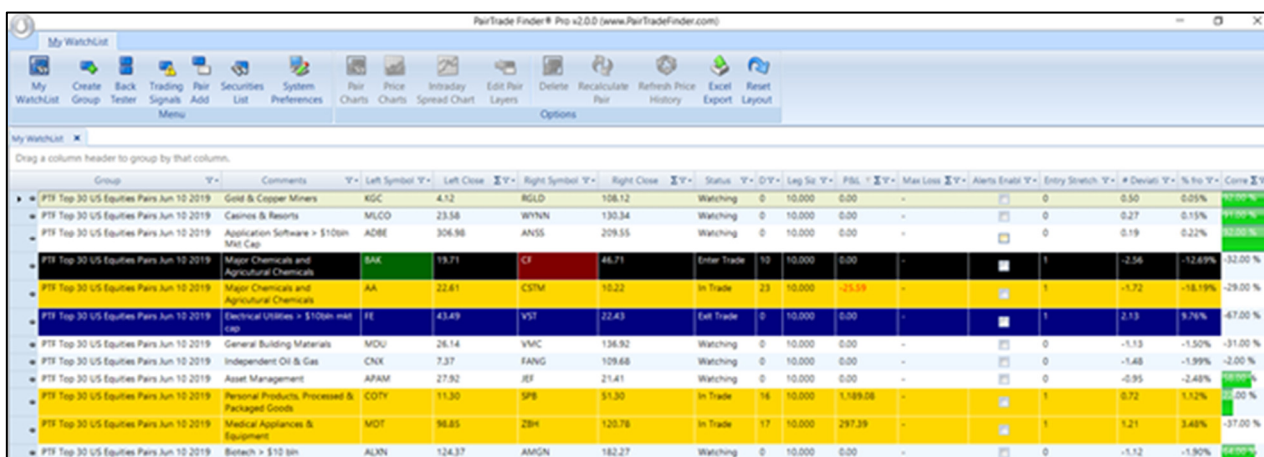
You will then be prompted to select the datafeed with which you wish to Create the Top 30 Group in My Watchlist. NB: if you wish to use IQ Feed or Interactive Brokers data to create your Top 30 Group then these feeds must have been connected to PTF PRO previously (see relevant sections further on in this manual):



Once you have selected your datafeed, PTF PRO will then access the relevant API for the historical data and begin creating the Top 30 Pairs one-by-one. You will see these populate in My Watchlist as it occurs. Initially, they will show no data in the rows in My Watchlist until PTF PRO goes and fetches the latest data update, which takes a few minutes:



After loading, My Watchlist should display all 30 Pairs under the Group name "PairTrade Finder PRO Top 30 US Equities Pairs" plus the date of creating the Group. The Commentary section will have the Industry Subsector from which each pair is drawn. You may have to close and re-open My Watchlist for this commentary section to populate:



Group	Comments	Left Symbol	Left Close	Right Symbol	Right Close	Status	DT	Leg Size	P&L	Max Loss	Alerts Enable	Entry Stretch	Deviation	% to Y	Correlation
PTF Top 30 US Equities Pairs Jun 10 2019	Gold & Copper Miners	KGC	4.12	RGLD	108.12	Watching	0	10,000	0.00	-	<input type="checkbox"/>	0	0.50	0.05%	97.00%
PTF Top 30 US Equities Pairs Jun 10 2019	Casinos & Resorts	MLCO	23.58	WYNN	130.34	Watching	0	10,000	0.00	-	<input type="checkbox"/>	0	0.27	0.15%	99.00%
PTF Top 30 US Equities Pairs Jun 10 2019	Application Software > \$100m Mkt Cap	ADBE	306.98	ANVS	209.55	Watching	0	10,000	0.00	-	<input type="checkbox"/>	0	0.19	0.22%	93.00%
PTF Top 30 US Equities Pairs Jun 10 2019	Major Chemicals and Agricultural Chemicals	BAK	19.71	CF	46.71	Enter Trade	10	10,000	0.00	-	<input type="checkbox"/>	1	-2.56	-12.69%	132.00%
PTF Top 30 US Equities Pairs Jun 10 2019	Major Chemicals and Agricultural Chemicals	AA	22.81	CSTM	10.23	In Trade	23	10,000	-15.15	-	<input type="checkbox"/>	1	-1.72	-18.19%	-29.00%
PTF Top 30 US Equities Pairs Jun 10 2019	Electrical Utilities > \$100m mkt cap	FE	43.69	VST	22.43	Exit Trade	0	10,000	0.00	-	<input type="checkbox"/>	1	2.13	9.76%	-47.00%
PTF Top 30 US Equities Pairs Jun 10 2019	General Building Materials	MDU	26.14	VVC	136.92	Watching	0	10,000	0.00	-	<input type="checkbox"/>	0	-1.13	-1.50%	-31.00%
PTF Top 30 US Equities Pairs Jun 10 2019	Independent Oil & Gas	CNK	7.37	FANG	109.68	Watching	0	10,000	0.00	-	<input type="checkbox"/>	0	-1.48	-1.99%	-2.00%
PTF Top 30 US Equities Pairs Jun 10 2019	Asset Management	APAM	27.92	JEF	21.41	Watching	0	10,000	0.00	-	<input type="checkbox"/>	0	-0.95	-2.48%	-10.00%
PTF Top 30 US Equities Pairs Jun 10 2019	Personal Products, Processed & Packaged Goods	COTY	11.30	SPB	\$1.30	In Trade	16	10,000	1,189.06	-	<input type="checkbox"/>	1	0.72	1.12%	-2.00%
PTF Top 30 US Equities Pairs Jun 10 2019	Medical Appliances & Equipment	MDT	98.85	ZBH	120.78	In Trade	17	10,000	297.39	-	<input type="checkbox"/>	1	1.21	3.48%	-37.00%
PTF Top 30 US Equities Pairs Jun 10 2019	Bereich > \$10 bn	ALXN	124.37	AMGN	182.27	Watching	0	10,000	0.00	-	<input type="checkbox"/>	0	-1.12	-1.90%	94.00%

We often vary the selection criteria for each Top 30 Update based on request and comments received from subscribers, so please get in touch with us if there are additional lists and selection criteria you would like us to research and produce.

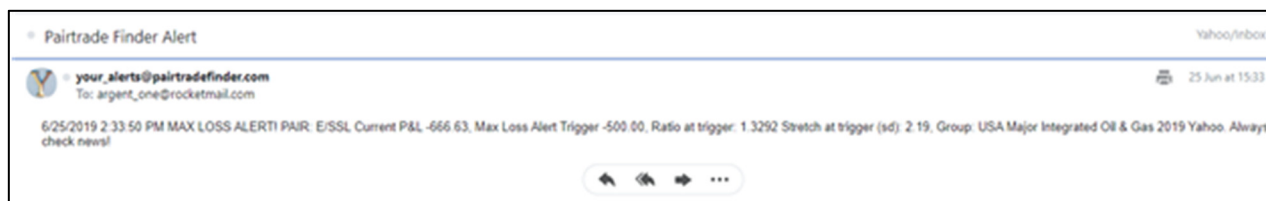
## 2.11 Using Max Loss Alert to Trigger Stops and Trailing Stops

The newest feature we have implemented in PTF PRO v2.0 is the Max Loss Alert function. This function allows you to set a maximum loss amount at which, when the EOD or Intraday Profit and Loss of any given pair reaches that amount, an audio and email alert will immediately be sent.

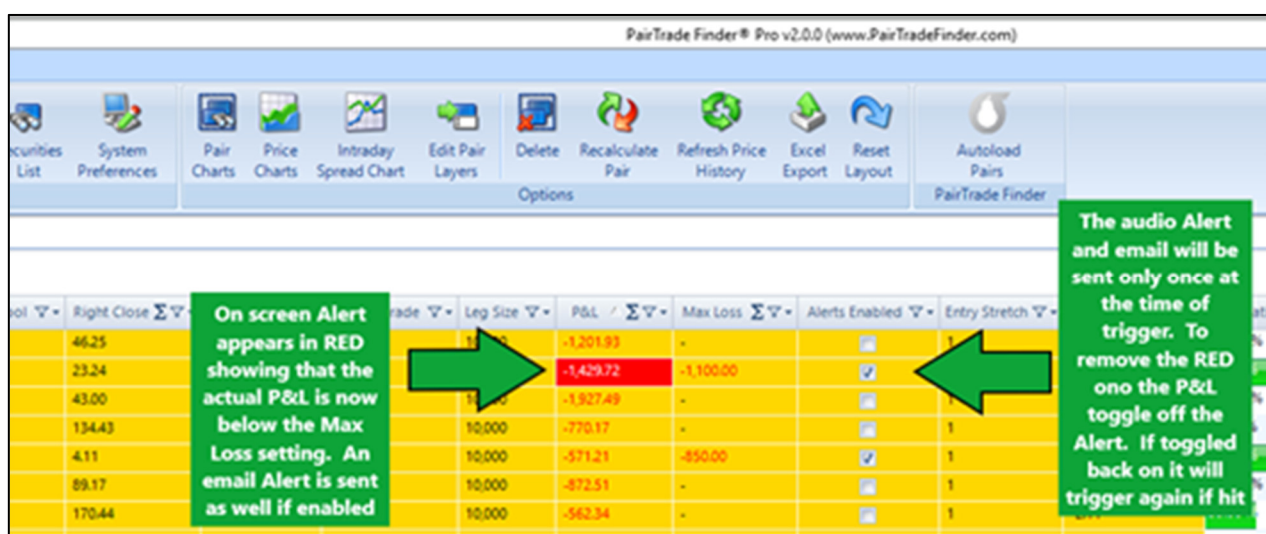
For example, if the pair E/SSL on My Watchlist is not performing well and has a running P&L of -\$1088 as in the screenshot below, you can click on the Max Loss column and input an amount of maximum loss at which you want PTF PRO to send you an Alert (say \$1,500 as in the example below) so that you can close the trade. The column next to the Max Loss column is headed Alerts Enabled and allows you to toggle on/off a Max Loss Alert on a pair-by-pair basis.



A Max Loss Alert will be delivered by email (when you have email alerts enabled) and will look something like this (different settings than example above):

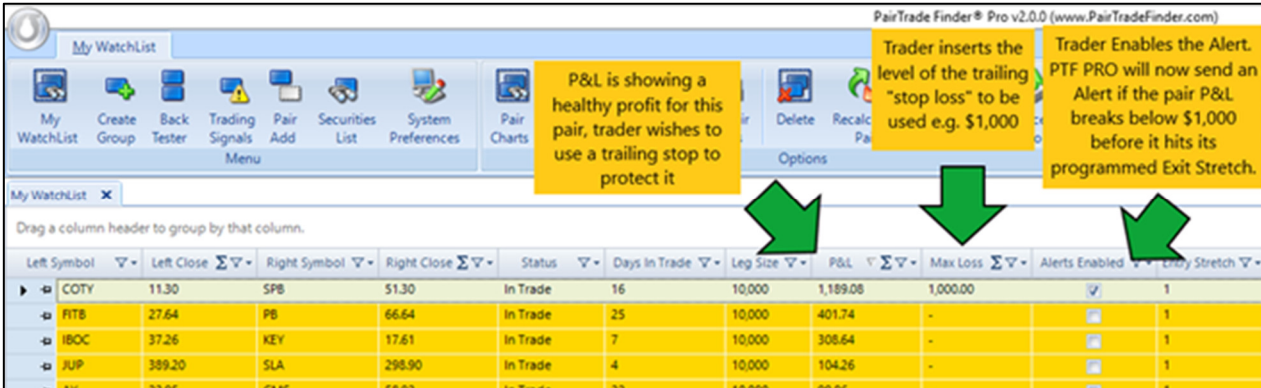


At the same time, the Max Loss column and box for the pair in question will highlight in RED, offering a visual alert, and an audio alert will sound as well (if enabled):



Whether you use max loss stop losses or not in your pair trading plan is up to you. Some traders do, others do not and rely on small position sizing and very large cap/low volatility shares to protect their downside risk. We will discuss this point further in section 4.7 below.

However, there is an excellent use of the Max Loss feature that we believe all pair traders may consider, and that is to employ it as a trailing stop alert. Say a pair you are trading has moved into a healthy profit position, in excess of the average net profit per trade historically. Let's take COTY/SPB below. The current EOD P&L is \$1,189. But the # of Dev is still 0.75, when the Exit Stretch is 0.00. Perhaps the trader got a very wide Entry Stretch on this pair. Perhaps it is now well over historic Average Net Profit per Trade and/or Average Net Profit of Winning Trades (in fact COTY/SPB shows over \$1,400 Avg Net Profit a Trade and 100% winners, but please follow our hypothetical example). The trader may elect to close their position and take the \$1,198 profit or they may elect to implement a trailing stop to protect the profit. To set a trailing stop at \$1,000 for example, the trader need only type in 1000.00 into the Max Loss column and enable the Alert:



My WatchList

My WatchList x

Drag a column header to group by that column.

Left Symbol	Left Close	Right Symbol	Right Close	Status	Days In Trade	Leg Size	P&L	Max Loss	Alerts Enabled	Entry Stretch
COTY	11.30	SPB	51.30	In Trade	16	10,000	1,189.08	1,000.00	<input checked="" type="checkbox"/>	1
FITB	27.64	PB	66.64	In Trade	25	10,000	401.74	-	<input type="checkbox"/>	1
IBOC	37.26	KEY	17.61	In Trade	7	10,000	308.64	-	<input type="checkbox"/>	1
JUP	389.20	SLA	298.90	In Trade	4	10,000	104.26	-	<input type="checkbox"/>	1
AV	33.66	FAK	68.62	In Trade	33	10,000	66.66	-	<input type="checkbox"/>	1

Annotations:

- P&L is showing a healthy profit for this pair, trader wishes to use a trailing stop to protect it
- Trader inserts the level of the trailing "stop loss" to be used e.g. \$1,000
- Trader Enables the Alert. PTF PRO will now send an Alert if the pair P&L breaks below \$1,000 before it hits its programmed Exit Stretch.

PTF PRO will send an Alert if the P&L of COTY/SPB trades below \$1,000 at which point the trader can close the trade and protect that level of profit. However, if the P&L doesn't reverse, the trader can ride the pair for greater profit when it may hit 0.00 sd, and substantially higher profit, without reversing below \$1,000. In this example \$1,000 is perhaps too tight a trailing stop, perhaps \$500 or a volatility computed distance (say 1sd) may be more appropriate. Again, up to you as the trader. As you craft a trading plan that is not only profitable and robust, look to build in risk management settings that meets your personal risk tolerances and preferences.

## 2.12 Keeping Records and Position Sizing

As a pair trader, it is very important you keep detailed records of all trades - both simulated and live - as this record gives you a journal from which you can review your behaviour and learn. It also allows you to keep track of your ACCURATE profit and loss from your pair trading activity. In pair trading, as in all trading, it is also critical that you have the right position sizing formula based on your risk tolerance, investment objectives and available leverage. We cannot suggest a one-size-fits-all position sizing formula as every trader is different. They also use a multitude of brokers which offer different leverage. We can give you an outline on how to approach position sizing with the help of our position sizing spreadsheet.

You will find the spreadsheet for [download here](#).

In this spreadsheet you can record your trades, your entry and exit prices, and the sheet will automatically calculate the % PnL return for the pair trade as a whole. You can also use the spreadsheet to calculate how many shares to buy or sell.

You will also find in the Trading Signals window the quantity of shares to buy or sell for a trade which is calculated on your defined Trade Value per Side. The default is size \$10,000/side or leg. This quantity is automatically adjusted for the Trade Value per Side assigned to each Entry Layer.

If you are using PTF PRO's integration with Interactive Brokers for semi-autotrading, all Interactive Brokers' Order Send tickets also have these amounts adjusted accordingly to each Entry Layer and the Exit. If you have set your IB orders to be "Pair Trade" type orders, the long leg quantity is assigned an approximate value as it is a Market order.

When pair trading, our aim is to trade dollar neutral, that is, equal dollar exposure on both the long and short legs. For example, if you had a \$10,000 trading account you may wish to place \$2,000 in each trade. Accordingly, you would take \$2,000 and divide it by the share price to work out the quantity to buy/sell: e.g.  $\$2000 / \$35 \text{ a share} = 57 \text{ shares}$  to buy or sell as the case may be.

**Good pair trading is all about making MANY SMALL TRADES with an edge. We recommend that you DO NOT EVER PLACE A LARGE PERCENTAGE OF YOUR ACCOUNT IN ANY ONE TRADE, as in the rare case of a large overnight move (merger or acquisition, adverse or highly positive unsystematic event on one symbol) the resulting gap will negatively affect your whole account.**

Spreading your risk is what will keep you in the pair trading game for the long term and is to be encouraged. We suggest trading a diversified portfolio of pairs from different sectors, industries, asset classes and avoiding focusing on the results of just one trade. Your attention should be focused on the performance of 50, 100 or more small position-size trades over time. This mindset and discipline is what separates the professional from the novice



## 3 Using PairTrade Finder® PRO with Other Markets

### 3.1 Real-Time Data into PTF PRO: DTN.IQFeed

To use PairTrade Finder® PRO with real-time data, a subscriber has two options: DTN IQFeed or Interactive Brokers.

DTN IQFeed is a paid third-party subscription service. It provides data on equities, futures, options, commodities and forex, et.al. Equity market coverage is US exchanges, London Stock Exchange and the Toronto Stock Exchange. Subscription packages can be on just FX, just equities, or other combinations. Use our link here: [www.iqfeed.net/pairtradefinder](http://www.iqfeed.net/pairtradefinder) with our extension as we have an arrangement with IQfeed where the normally charged \$50 setup fee is waived for PTF PRO users. We are not compensated for this referral.

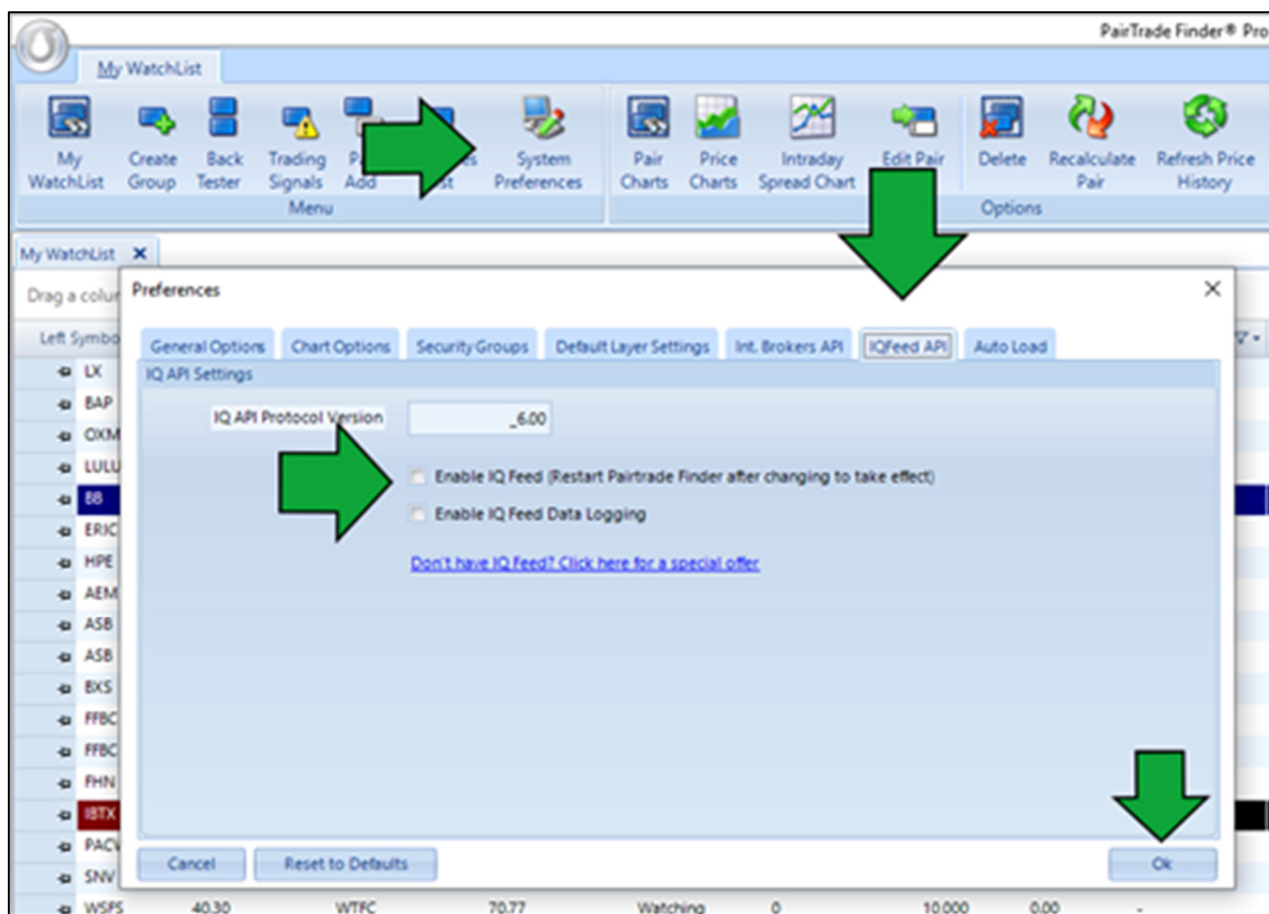
Whilst you may be used to getting free data, if you are a serious trader you will have realised there is nothing more important than getting quality, clean data. A bad tick on free data could cost you hundreds of dollars, which would have been saved with a simple monthly subscription to real time data. IQfeed isn't the cheapest provider, however we believe they offer the best value when it comes to markets covered and quality of data, hence they have over 80,000 clients.

Signing up to IQfeed is a simple process. To get started, complete their online free trial registration form, then download their software:

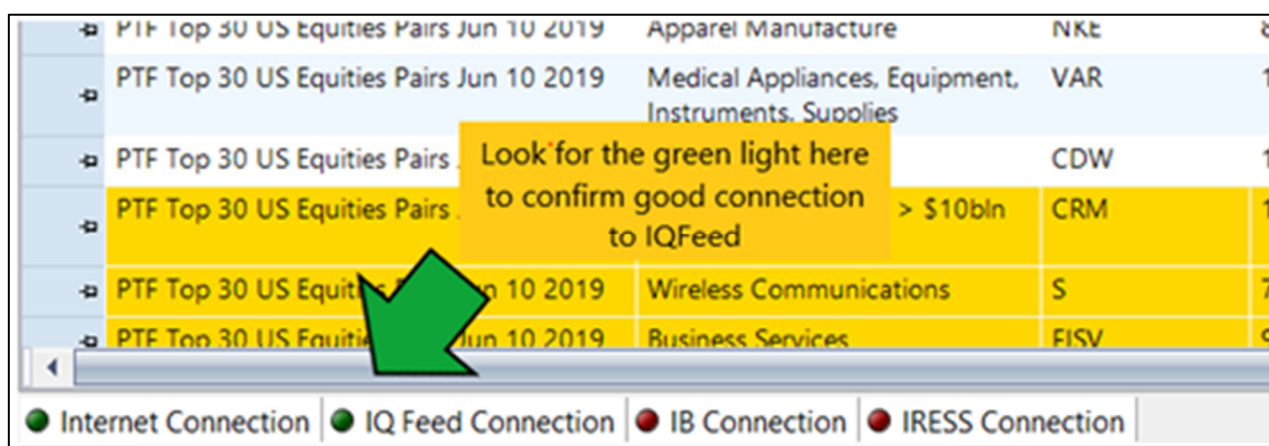


The screenshot shows the DTN IQFeed website. The header includes links for 'about', 'privacy', 'site map', and 'fee calculator'. A large banner on the right says 'Join our other 80,000 customers who enjoy the fastest, most reliable, professional market data available.' Below this, a 'Welcome to DTN IQFeed!' message is displayed. On the left, there is a sidebar with 'Need a Feed?' for Traders and Developers, contact information for sales, and support links for Sales, Technical, and Billing support, all marked as 'UNAVAILABLE'. The main content area has a 'Get Free Trial Now' link highlighted with a green arrow and a yellow box saying 'Start by signing up for a free trial'. Another green arrow points to the 'Download Client' link, with a yellow box saying 'After signing up, download the IQFeed software'. Other links in the main area include 'About IQFeed', 'Services', 'Fees', 'CME Exchange Fee Waiver', 'Software/Mentors/Brokers', 'Symbol Guide', 'Symbol Look-Up', 'Download Client', 'IQFeed FAQ', 'Support', 'Live Chat', 'Contact Us', 'Manage Account', 'Developer Login', and 'Developer Registration'.

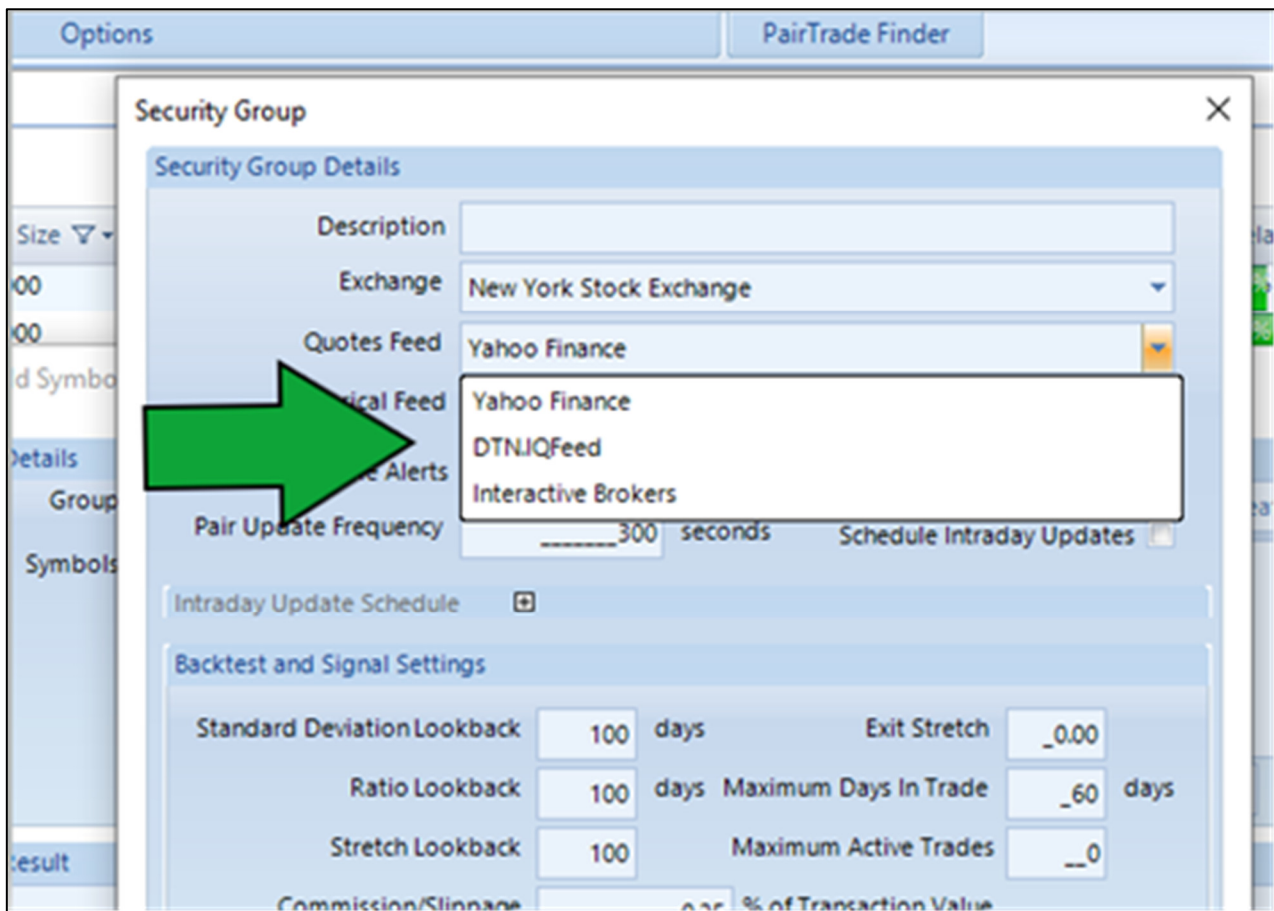
Once you have signed up to IQfeed, have successfully downloaded and engaged the IQFeed client on your desktop, then you will need to enable IQfeed in PTF PRO, please click on System Preferences/IQ Feed API tab, then enable IQfeed:



Then restart PairTrade Finder PRO for the change to take effect. If you are properly connected to IQFeed you will see a green light in the lower left corner of PTF PRO on the IQFeed Connection box:



You will not be able to change the datafeed selected for your existing groups. This precaution ensures database integrity. Therefore, to use IQFeed you will need to create new Groups and set the datafeed for both Historical Feed and Quote Feed to DTN.IQFeed:



## 3.2 Real-Time Data: Integrating Interactive Brokers' TWS

Your other option for getting real-time data into PTF PRO is to open a brokerage account with Interactive Brokers ("IB") and integrate PTF PRO with your local version of Trader Workstation ("TWS"). We believe Interactive Brokers represents the best value and best execution online discount broker for pair traders, offering commissions of as low as \$0.005 per share and margin rates well below their competition. They also cover 126 markets in 20 countries, making them the natural choice for any pair trader trading internationally.

If you are not yet a subscriber to PTF PRO and you have never had an Interactive Brokers' account, we offer you a \$99 rebate 30 days after you subscribe for PTF PRO if you open an Interactive Brokers' account through our referral invite. Just send us a request for a referral invite to [admin@pairtradefinder.com](mailto:admin@pairtradefinder.com) and we will send you an email with the link you need to use.

Once you have an IB account, you will need to ensure that you have real-time data permissions enabled in IB for the markets you wish to trade. IB's rates for these are among the lowest. Real-time data on all USA equity exchanges come out at about \$8-\$9/month for a non-professional, versus about \$85/month for IQFeed.

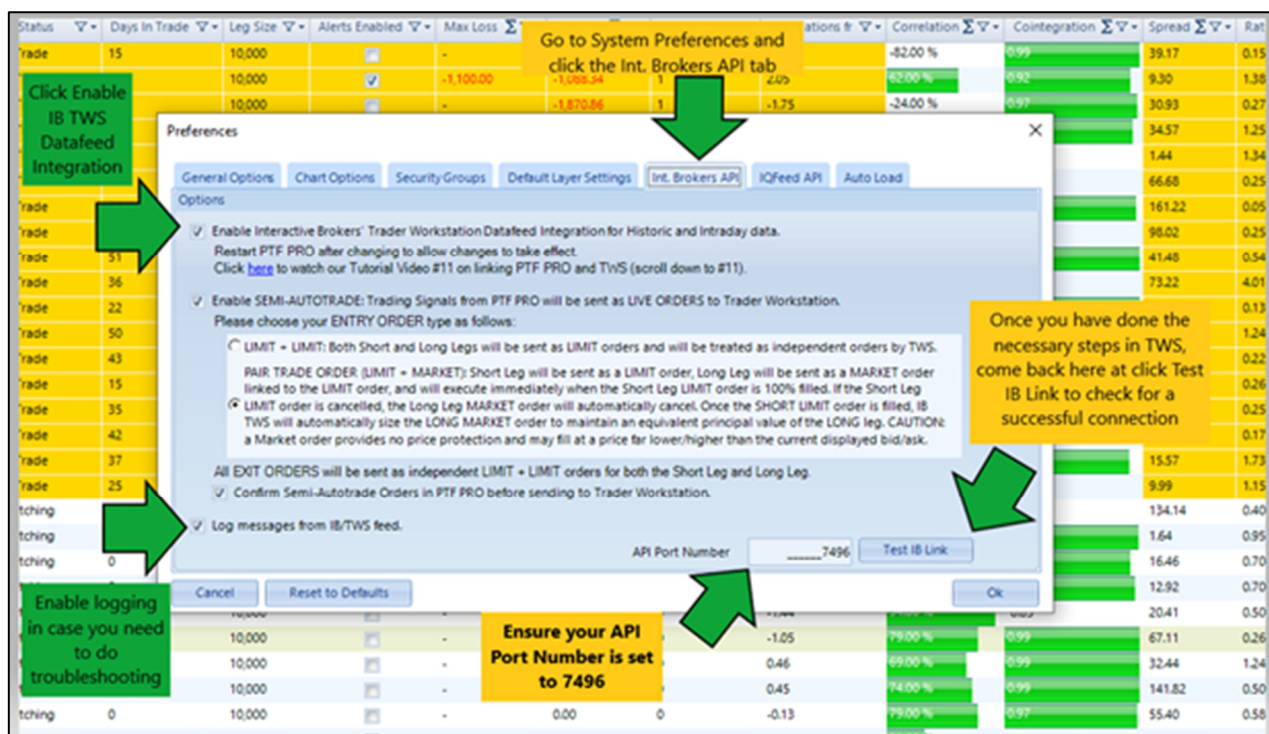
Integrating your PTF PRO with IB TWS is quick and easy. There is a tutorial video #11 here that can walk you through it real-time: <https://pairtradefinder.com/gettingstartedptfpro.html>

In your Trader Workstation, which needs to be open on your desktop at all times for the integration to work, undertake the following steps. Go to Edit/Global Configuration/API/Settings and follow the instructions in the screenshot below:

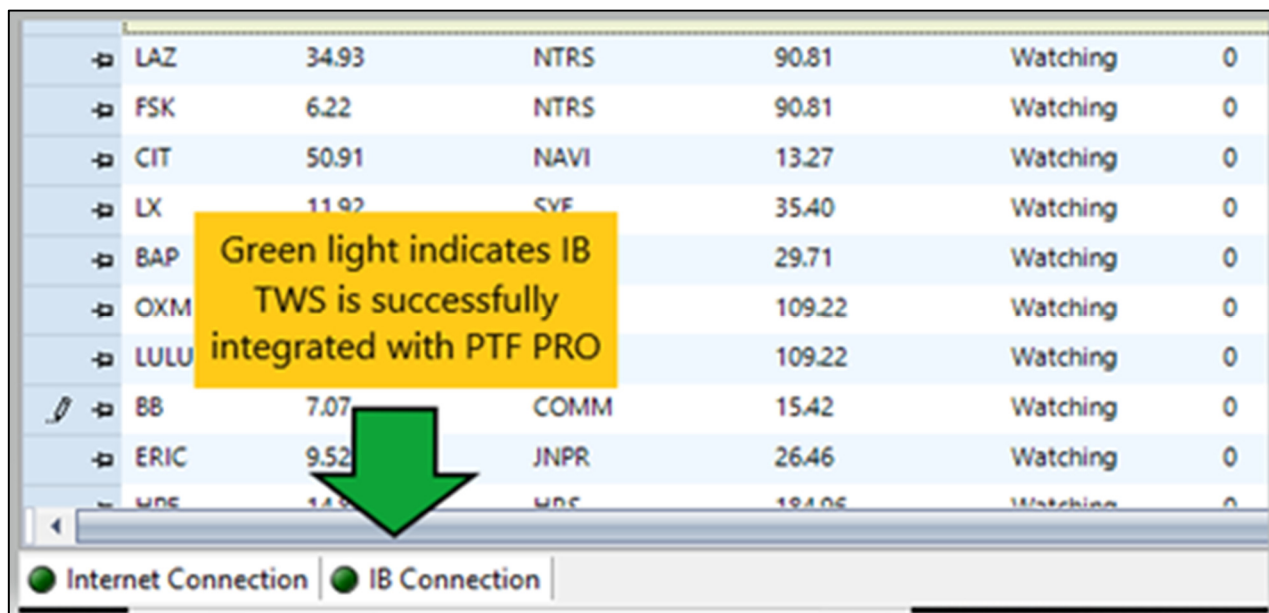




Then go to **System Preferences** and open the **Int. Brokers API** tab. Here you will also see a link directly to Tutorial #11 to help you get integrated as well. The screenshot below shows you the steps you need to follow:



If you are properly connected to IB you will see a green light in the lower left corner of PTF PRO on the IB Connection box:

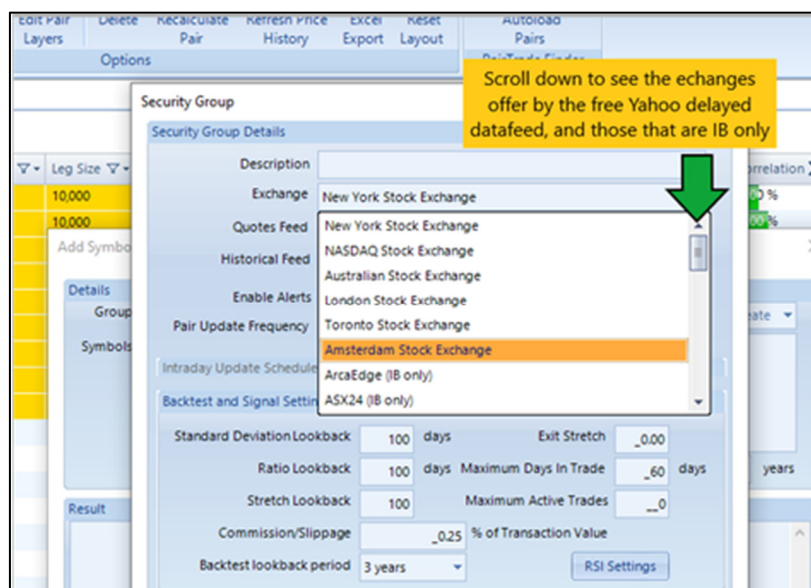


Enabling semi-autotrading with IB and configuring order types is handled in section 4.4 below.



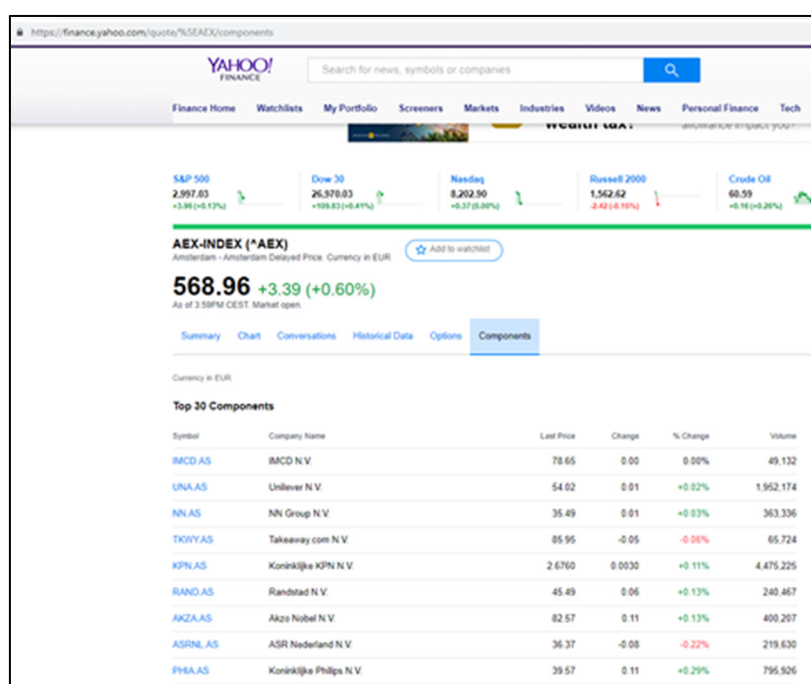
### 3.3 Using PTF PRO with International Stocks

PairTrade Finder® PRO sources its data from Yahoo! Finance by default. The Yahoo API provides free 5-15 min delayed stock data and this data is automatically imported into the software by PTF PRO's default settings. Yahoo! Finance supports many of the western international stock exchanges, and you can find a list of supported exchanges by clicking on the scroll down menu in PTF PRO when you look to Create a Group:

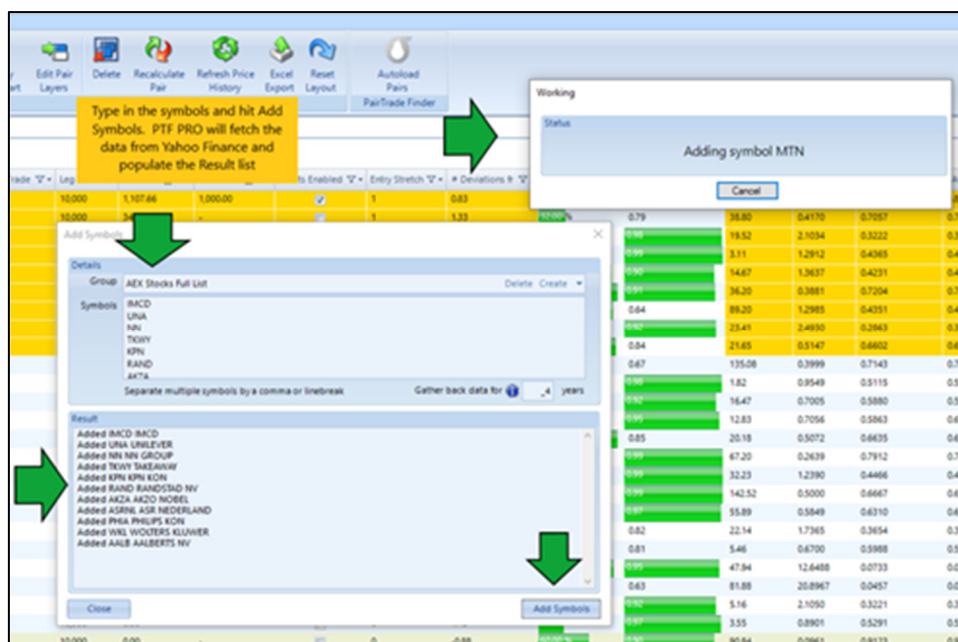


Select the exchange for which you wish to create a group of stocks for backtesting. In this example we are going to choose the Amsterdam Stock Exchange.

Next, you will want to add relevant codes for that exchange. Unless you know your local codes off-by-heart, go to your local Yahoo Finance page and look for the local index listing, in the AEX example this is the ^AEX. Click on this index, and then click on Components for stock codes as shown below:



We create a new group for AEX Full List, and you then type in the symbols to add them to the Group below:



Other indices you can type in the Yahoo! Finance quote box to find relevant codes are;

^**DJI** (Dow Jones Industrial – Top 30 US stocks)

^**SPX** (SP500 Index – Top 500 US Stocks)

^**GSPTSE** (TSX – Canadian Index)

^**AXJO** (ASX200 – Australian Index)

^**HSI** (Hang Seng – Hong Kong Stocks)

^**GDAXI** (DAX30 – Top German Stocks)

^**FCHI** (CAC 40 – Top France Stocks)

You can find an expanded list [here](#).

Most of the codes you can find in Yahoo! Finance can be imported into PTF PRO (NSE and BSE of India are notable exceptions).

Additionally, with the 126 markets and 20 countries covered by Interactive Brokers, and IQFeed's 600,000+ importable instruments, it is possible to literally import over 1 million different instruments into PTF PRO. You can even import things like non-tradeable indices like advance/decline line, TICK, TRIN, etc. and compare them to indices, futures, options or anything you can think of with which to pair for some interesting results. The sky is the limit to possible combinations.

For example if you wanted to pair the French stock index against the German stock Index, you would create a group with NYSE as the exchange, and add codes ^**FCHI** and ^**GDAXI** (the same codes used in Yahoo! Finance) you could then backtest the performance of this pair for the past 10 years.

With over 1 million importable instruments, there are literally billions of possible pair combinations available to you at a click. Do not underestimate the power of this software to analyse everything! If it moves, we can pair it and trade it. As far as we are aware, we are the only platform available to retail traders that has the power and reach to do this analysis and trading.

## 3.4 Using PTF PRO with Futures and Commodities

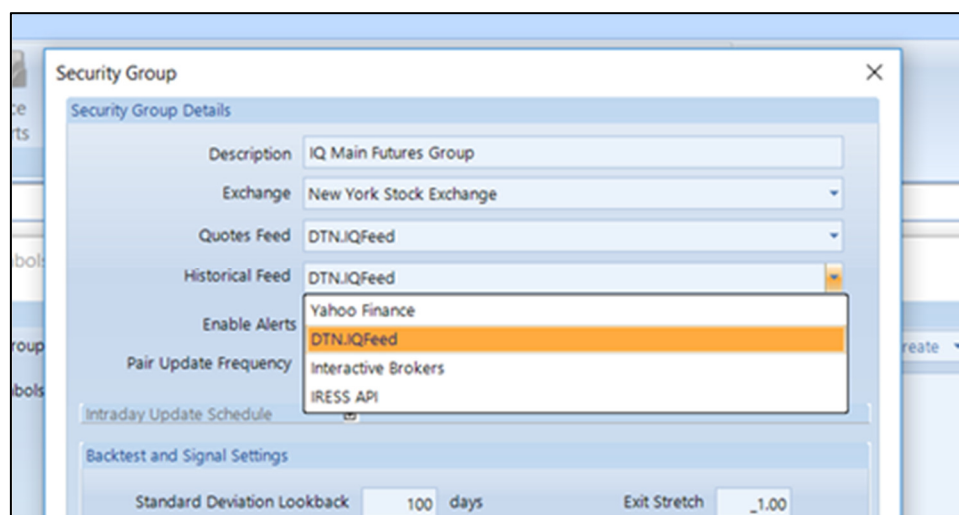
PTF PRO can be used to trade more exotic instruments as well. We only recommend trading futures, commodities, options and FX for more experienced traders. New traders should learn how to pair trade stocks to begin with before venturing into derivative products.

### Futures & Commodities Data

To use PairTrade Finder® PRO with futures and commodities requires a data subscription from <http://www.iqfeed.net/pairtradefinder> as per section 3.1 of this manual, or an integration with Interactive Brokers. Once you have an IQfeed subscription or an integrated Interactive Brokers' account and hence their respective data feeds enabled in PTF PRO, you can now import futures contracts. Please note that some exchanges require different subscriptions with IQfeed. The basic subscription does cover most contracts, however some require additional exchange subscriptions. If using IB TWS, you will also have to enable your relevant trading permissions for futures in Interactive Brokers Account Management and ensure you have real-time data available.


We will begin with an example of some of the most popular futures contracts available with the basic data subscription from IQfeed.

To start, create a group with NYSE as the specified exchange:




And ensure you choose DTN.IQFeed as both the Historical Feed and Quotes Feed datasource.


Use the [IQfeed symbol look-up guide](#) on their webpage to locate the relevant contract codes for the instruments you wish to trade.


 **Support**


- Symbol Guide
- Symbol Look-Up
- Download Client
- IQFeed FAQ
- IQFeed YouTube Channel
- Support Forums
- Live Chat
- Contact Us
- Manage Account

Have a Question for Sales?  
Call 800-475-4755  
or  
Email [sales@iqfeed.net](mailto:sales@iqfeed.net)

FOLLOW US ON 

 **Sales Support**  
UNAVAILABLE

 **Technical Support**  
CLICK TO CHAT

 **Billing Support**  
UNAVAILABLE

### SUPPORT: Symbol Lookup

You may [DOWNLOAD](#) a complete tab-delimited list of all symbols in a .txt format (file is .zip to provide a smaller download). File Updated: 07/11/2019 06:08:19 AM central time.

[Click Here](#) for a short video on how to use our symbol lookup page.

**Symbol Lookup**

Search Text/String:  
gold

Records to Display:  
50 records

Search by:  
☒ Name/Description  
☐ Symbol  
☐ SIC Code  
☐ NAICS Code

Filter by:  
Exchange:  
ALL EXCHANGES

Security Type:  
ALL SECURITY TYPES

Search Options:  
☐ Show Front Mon. Only (Futures)    ☐ Show E-minis Only (Futures)  
☐ Show Comb. Session Only (Futures)    ☐ Don't Show Options  
☒ Show Continuous Contr. Only (Futures)    ☐ Don't Show Spreads (Futures)

Output Options:  
☒ HTML Table  
☐ Symbols Only (for cut/paste)  
☐ ASCII CSV (for import)

Search

Total Available Records: 1756564

Displaying records 1-22 out of 22 total

SYMBOL	DESCRIPTION	EXCHANGE	SECURITY TYPE	LISTED MARKET
QMGC#	E-MICRO GOLD AUGUST 2019	COMEX	FUTURE	COMEX_GBX
QMGT#	E-MICRO GOLD TAS AUGUST 2019	COMEX	FUTURE	COMEX_GBX
@QO#	E-MINI GOLD AUGUST 2019	COMEX	FUTURE	COMEX_GBX
GCT#	GOLD (TAS) AUGUST 2019	COMEX	FUTURE	COMEX_GBX
@ZG#	GOLD 100 OZ AUGUST 2019	ICEFU	FUTURE	ICEFU
BOZI#	GOLD AUGUST 2019	BMF	FUTURE	BMF
IGC#	GOLD AUGUST	MCX	FUTURE	MCX

Below we reproduce for you some codes for continuous futures contracts - that is contracts that don't expire. You can trade front month contracts. However, you will need to remove and add fresh contracts with every expiry cycle. They also cannot be backtested effectively except over 90 day or less periods. We use continuous contracts as a result.

### IQFeed Continuous Futures Contract Codes: Main Contracts

@BO# (soybean oil), @C# (corn), @GF# (feeder cattle), @HE (lean hogs), @RB# (random length lumber), @LE@ (live cattle), @O# (oats), @PB# (pork bellies), @S# (soybeans), @W# (wheat), @ZG# (gold), @YI# (1,000 oz Mini Silver), LRC# (robusta coffee), QC# (cocoa), QW# (white sugar), @TY# (10-Year Treasury), SP# (S&P 500 Index), @YM# (E-Mini Dow Jones), @NQ# (NASDAQ 100), @RTY# (E-Mini Russell 2000), QHCL# (WTI Crude Oil), etc.

You can use these codes, as found in the IQfeed symbol look up guide, to add into PTF PRO. **NB: However, if the symbol contains an "@", then you need to input it with square brackets around it e.g. [ @BO# ] for soybean oil.**

## Adding Futures Codes using Interactive Brokers Datafeed

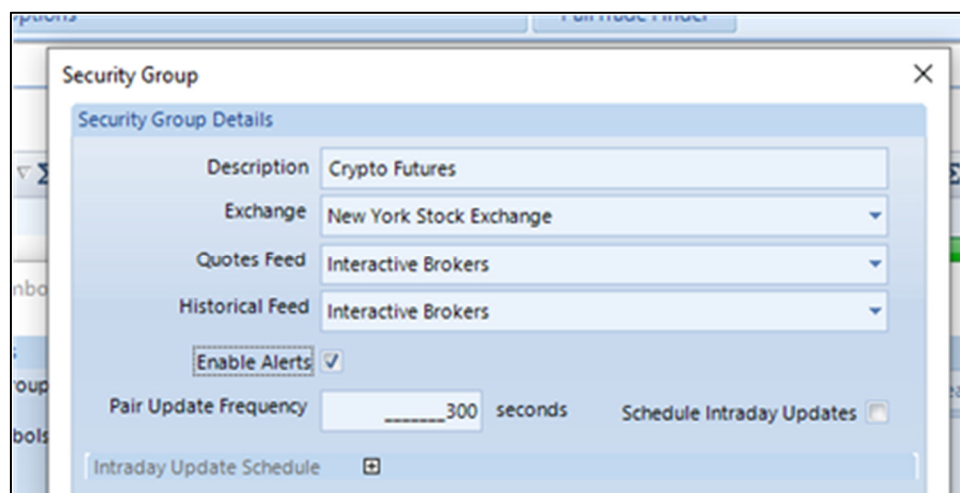
To input futures using Interactive Brokers' datafeed, use this syntax:

<Symbol>:FUT@<Exchange>

For example: VUK8:FUT@CFE or HOK8:FUT@NYMEX

It also works for cryptocurrencies e.g. XBTJ8:FUT@CMECRYPTO and BTCM8:FUT@CMECRYPTO

Go to Create Group, chose NYSE and select Interactive Brokers as the datafeed for both Historical Feed and Quotes Feed:



**N.B. For contracts traded on CBOT the symbol should be in the following format:**

<Root> <Space> <Space> <Space> <3-letters month code> <Space> <2-digit year>:FUT@ECBOT

For example: 'ZW JUL 18:FUT@ECBOT' works.

## Cross Asset Pairings

You could also pair stocks against futures, for example you could compare gold stocks NEM, KGC, GG, and ABX against the gold futures @ZG# for some interesting trading opportunities. Just add your desired stocks into the same group as your futures contract then use the backtester as already shown.

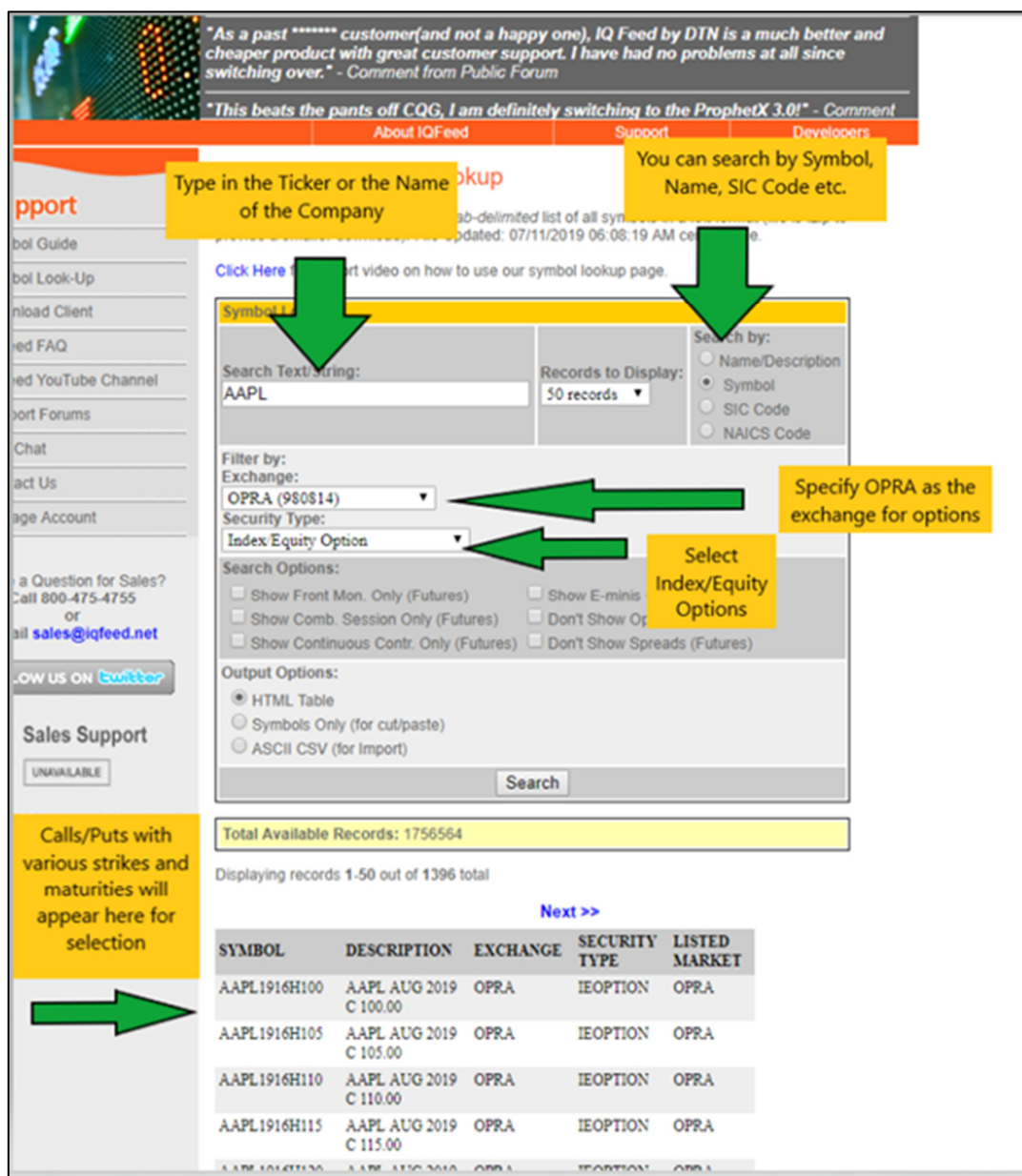


### 3.5 Using PTF PRO with Options

Just as above, you will need a DTN IQFeed subscription to import options into PTF PRO. Please read instructions in section 3.1 of this user manual on how to install this datafeed.

Please specify the NYSE as the exchange when creating a new group to house your option contracts. Then use the [IQfeed symbol look-up guide](#) to locate relevant option codes to import into PTF PRO. As with stocks and futures, we highly recommend you only trade the most liquid contracts, with the case of options, this is mostly comprised of the S&P100, that is the top 100 liquid stocks. You may wish to trade other stocks in the S&P500; however, the more liquid the option, the tighter the spread and lower your trading costs.

When searching for options in IQFeed, specify OPRA as the exchange in the lookup window. Then specify index/equity options in the product field and type the stock code of the options you want displayed:



The screenshot shows the IQFeed Symbol Lookup interface. Annotations with green arrows point to specific fields and sections:

- Top Left:** "Type in the Ticker or the Name of the Company" points to the "Search Text/String:" field where "AAPL" is entered.
- Top Right:** "You can search by Symbol, Name, SIC Code etc." points to the "Search by:" dropdown menu.
- Middle Left:** "Specify OPRA as the exchange for options" points to the "Exchange:" dropdown menu, which is set to "OPRA (980\$14)".
- Middle Right:** "Select Index/Equity Options" points to the "Security Type:" dropdown menu, which is set to "Index Equity Option".
- Bottom Left:** "Calls/Puts with various strikes and maturities will appear here for selection" points to the table of results.

The "Search Options:" section includes checkboxes for "Show Front Mon. Only (Futures)", "Show Comb. Session Only (Futures)", "Show Continuous Contr. Only (Futures)", "Show E-minis", "Don't Show Op", and "Don't Show Spreads (Futures)".

The "Output Options:" section includes radio buttons for "HTML Table" (selected), "Symbols Only (for cut/paste)", and "ASCII CSV (for Import)".

The "Search" button is located at the bottom of the form.

Below the search form, it states "Total Available Records: 1756564" and "Displaying records 1-50 out of 1396 total".

The results table is as follows:

SYMBOL	DESCRIPTION	EXCHANGE	SECURITY TYPE	LISTED MARKET
AAPL1916H100	AAPL AUG 2019 C 100.00	OPRA	IEOPTION	OPRA
AAPL1916H105	AAPL AUG 2019 C 105.00	OPRA	IEOPTION	OPRA
AAPL1916H110	AAPL AUG 2019 C 110.00	OPRA	IEOPTION	OPRA
AAPL1916H115	AAPL AUG 2019 C 115.00	OPRA	IEOPTION	OPRA

You can compare the underlying stock to the options too, by adding the stock code into the same group as the options, e.g. you could add all the call options for AAPL into a group then add stock code AAPL as well to backtest pairs of stock vs options. You could get even more creative by comparing the call options of AAPL against a similar business like HPQ, SNE or SSNLF, or compare AAPL call options against the stock of SSNLF or HPQ. The combinations are endless and only limited by your imagination.

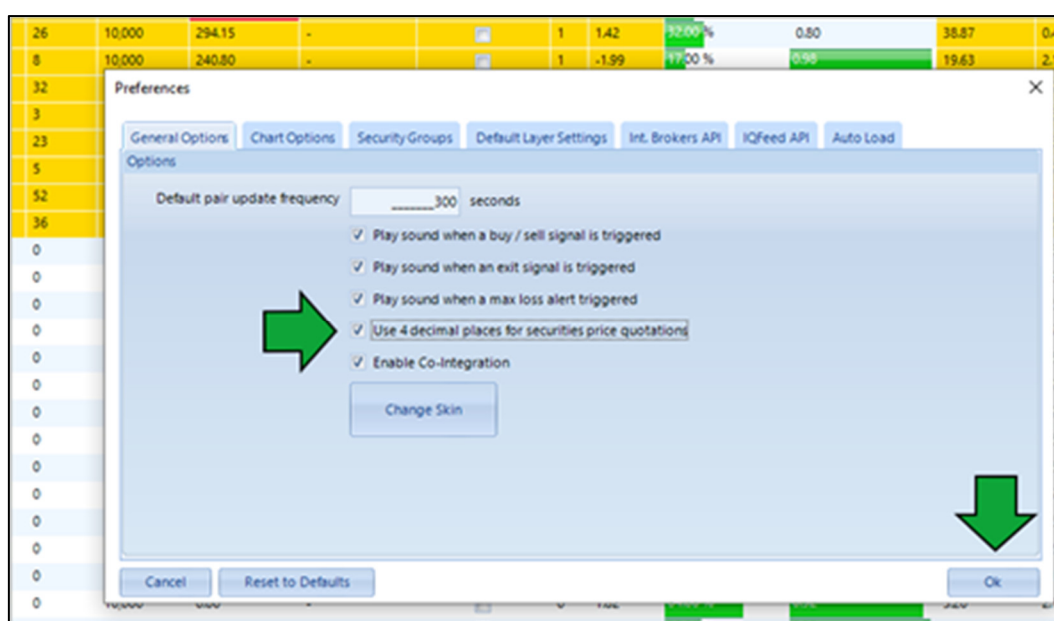
### **Options and Interactive Brokers**

For Interactive Brokers, unfortunately as of the date of writing of this manual, IB does not offer daily historical close data for options through their API. Accordingly, to backtest and trade options in PTF PRO, a subscription to DTN IQFeed is the only solution at this point.

## 3.6 Using PTF PRO with Forex and Cryptocurrencies

You can import foreign currency including cryptocurrency into PTF PRO. FX contracts are the spot instruments traded over the counter between large banks and with access offered via online brokers. There are many benefits to trading forex, including 24-hour deep liquidity, steady movements with limited price shocks, cheap access and high leverage. These features of the market can make trading forex very appealing to the online trader. For cryptocurrency instruments you will have to find a venue to trade if your regular broker does not offer them. Many brokers now do offer them and some offer 2:1 leverage CFDs for trading the major cryptos.

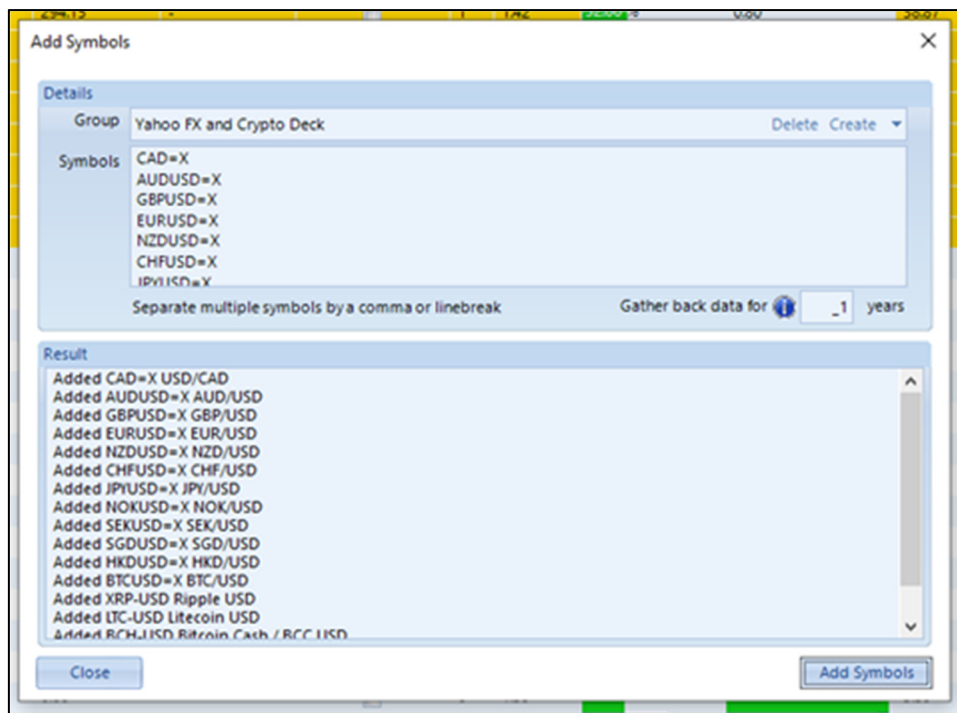
First, if you are trading FX or crypto with PTF PRO you will want symbols to be displayed to four decimal places so you can get high accuracy prices on your FX contracts. Go to **System Preferences/General Options** and click on the "Use 4 decimal places for securities price quotations" option. Click OK.



### Delayed FX data with Yahoo! Finance

You can get any currency pair that appear in Yahoo! Finance into PTF PRO for analysis. The data is delayed. However, for swing trading, it may still be adequate for your needs, this determination is up-to-you.

Yahoo! Finance datafeed currency and cryptocurrency symbols syntax can be gleaned from Yahoo! Finance by looking for the pairs you need. Here are some examples:



## Real-Time FX & Cryptocurrency Data

As with futures and options, you need an IQfeed subscription or an Interactive Brokers' integration to import **real-time forex and cryptocurrency data** into PTF PRO. Please refer to section 3.1 of this user manual for relevant instructions. In addition to the basic IQFeed subscription you will need to subscribe to forex data in their premium services section.

**IQFeed**

Free Trial Now \*\*

Services Premium Services Changes Online Account

Call for Sales? 3-475-4755 or [s@iqfeed.net](mailto:s@iqfeed.net)

**You will need to subscribe to basic forex data here**

**SALE SUPP**

**ABOUT IQFEED: Adding and Subtracting Services To Your Account**

To add premium services, select **Add Premium Services**.

To add additional exchanges, select **Add Exchanges**.

PLEASE NOTE: You must verify that your software vendor supports the premium services listed below. Not all Software Vendors have developed interfaces to these premium services.

Premium services have a one-time, \$10 activation fee.  
There is a \$20 Surcharge for Market Depth feeds such as Nasdaq Level II, a \$20 Surcharge for North American Futures exchanges and a \$25 Surcharge for International Futures exchanges.

**Add Premium Services**

Note: Not all services are supported by all third party software.

Free Trial	Subscribe	Description/Price
<input type="checkbox"/>	<input type="checkbox"/>	500 Additional Simultaneous Symbol Limit (\$40/mo) Increase IQFeed's already high symbol limit by adding an additional 500 symbols.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Basic Forex Data (Barclays and FXCM) (\$25/mo) Basic Forex Data (Barclays and FXCM)

However, with Interactive Brokers, real-time FX data is FREE.

As with futures and options, please select NYSE in the exchange field when creating a new group to house your currency crosses. IQFeed FXCM contracts have simple format:

[BASE CURRENCY][SECOND CURRENCY].FXCM

Shown below are the most liquid currency crosses and in the same format you would use to add them into PTF PRO if you are using IQFeed:

USDJPY.FXCM, EURUSD.FXCM, GBPUSD.FXCM, USDCHF.FXCM, AUDUSD.FXCM, NZDUSD.FXCM

For a full list of FX crosses you can add, please use the IQfeed symbol lookup guide and select FXCM as the exchange, eg:

### SUPPORT: Symbol Lookup

You may [DOWNLOAD](#) a complete tab-delimited list of all symbols in a .txt format (file is .zip to provide a smaller download). File Updated: 07/11/2019 06:08:19 AM central time.

[Click Here](#) for a short video on how to use our symbol lookup page.

**Symbol Lookup**

Search Text/String:

Records to Display:  
100 records ▼

Search by:  
☐ Name/Description  
☒ Symbol  
☐ SIC Code  
☐ NAICS Code

Filter by:  
Exchange:  
FXCM (44) ▼

Security Type:  
Foreign Monetary Exchange ▼

Search Options:  
☐ Show Front Mon. Only (Futures)    ☐ Show E-minis Only (Futures)  
☐ Show Comb. Session Only (Futures)    ☐ Don't Show Options  
☐ Show Continuous Contr. Only (Futures)    ☐ Don't Show Spreads (Futures)

Output Options:  
☒ HTML Table  
☐ Symbols Only (for cut/paste)  
☐ ASCII CSV (for Import)

Total Available Records: 1756564

Displaying records 1-17 out of 17 total

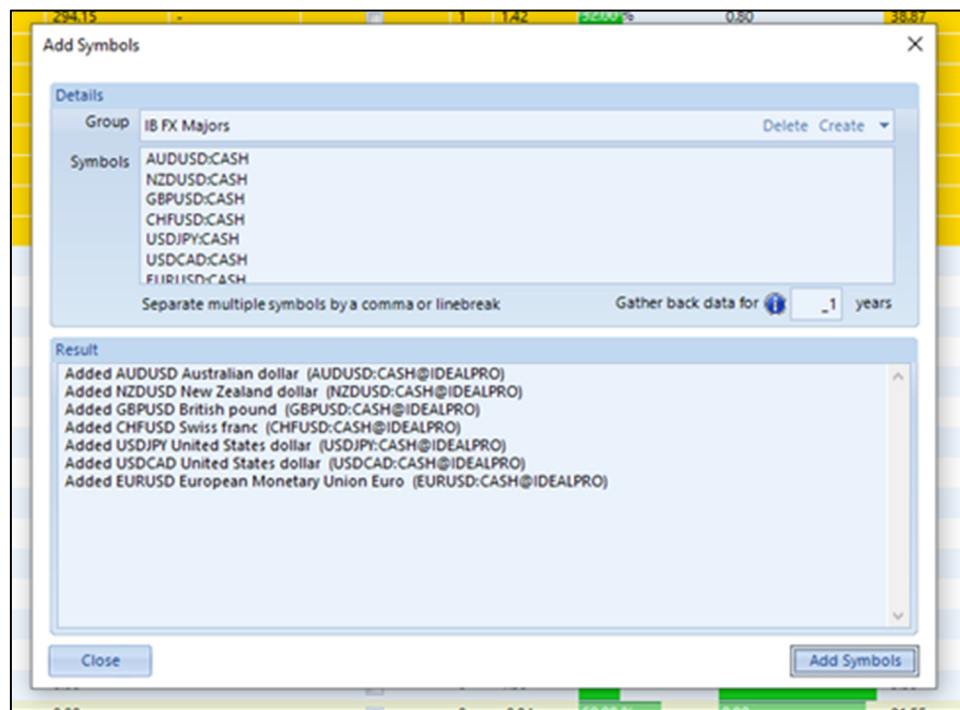
SYMBOL	DESCRIPTION	EXCHANGE	SECURITY TYPE	LISTED MARKET
AUDUSD.FXCM	FXCM AUD USD SPO	FXCM	FOREX	FXCM
EURUSD.FXCM	FXCM EUR USD SPO	FXCM	FOREX	FXCM
GBPUSD.FXCM	FXCM GBP USD SPO	FXCM	FOREX	FXCM
NZDUSD.FXCM	FXCM NZD USD SPO	FXCM	FOREX	FXCM
USDCAD.FXCM	FXCM USD CAD SPO	FXCM	FOREX	FXCM
USDCHF.FXCM	FXCM USD CHF SPO	FXCM	FOREX	FXCM
USDCNH.FXCM	FXCM USD CNH SPO	FXCM	FOREX	FXCM
USDHKD.FXCM	FXCM USD HKD SPO	FXCM	FOREX	FXCM
USDHUF.FXCM	FXCM USD HUF SPO	FXCM	FOREX	FXCM
USDJPY.FXCM	FXCM USD JPY SPO	FXCM	FOREX	FXCM
USDKRW.FXCM	FXCM USD KRW SPO	FXCM	FOREX	FXCM
USDNOK.FXCM	FXCM USD NOK SPO	FXCM	FOREX	FXCM
USDSEK.FXCM	FXCM USD SEK SPO	FXCM	FOREX	FXCM
USDTRY.FXCM	FXCM USD TRY SPO	FXCM	FOREX	FXCM
USDZAR.FXCM	FXCM USD ZAR SPO	FXCM	FOREX	FXCM
XAGUSD.FXCM	FXCM XAG USD SPO	FXCM	FOREX	FXCM
XAUUSD.FXCM	FXCM XAU USD SPO	FXCM	FOREX	FXCM



## With Interactive Brokers, the FX symbol format you need to use is:

<Currency1> <Currency2>:CASH (w/o exchange) - for example AUDCAD:CASH

Simply input these symbols in the Ticker Add screen of Create Group process once you have selected IB as the datafeed for Quotes and Historic:



PTF PRO uses the MIDPOINT datastream option from the IB TWS API for Forex data.

You could add some interesting pairs with FX, like the EURUSD against the EUR futures, or against the euro ETF code FXE, to create riskless arbitrage opportunities. Also oil tends to move in line with the euro, as Europe is a major importer of oil and central banks consider it a high factor in their inflation models which affect interest rates. Accordingly, you could pair the EURUSD against the crude oil futures contract or against oil ETFs like codes USO, OIL, or XLE.

Use the backtester as much as possible to find pairs which have performed the best over 1, 3 and 5 year periods. Make sure you only save the best performing pairs to My Watchlist for monitoring.

Once again, the possibilities of pairs that you can create is endless - you can find unique and exotic trading opportunities that only large hedge funds are used to enjoying. PairTrade Finder® PRO is the market-leading, and perhaps only, software platform available to retail traders that can allow you this flexibility and reach.

## 3.7 Using PTF PRO with Contracts for Difference (CFDs)

PairTrade Finder® can be used for analysing and trading contracts for difference ("CFDs"). CFDs present the trader with direct electronic access to OTC products that let you trade the difference between current and future pricing of a share, index or a currency-pair. When used with proper risk management and a reputable broker offering true direct market access ("DMA"), CFDs represent a powerful tool for the smaller retail trader to access significant leverage at low cost. These are available to non-USA and non-Canadian residents only.

### Interactive Brokers and CFDs

Interactive Brokers has a highly competitive CFD offering. IBKR currently offers approximately 7,100 Share CFDs covering the principal markets in the US, Europe and Asia. The constituents of the major indexes listed below are currently available as IBKR Share CFDs. In many countries IBKR also offers trading in liquid small cap shares. These are shares with free float adjusted market capitalization of at least USD 500 million and median daily trading value of at least USD 600 thousand. IB states that more countries will be added in the near future.

United States	S&P 500, DJIA, Nasdaq 100, S&P 400 (Mid Cap), Liquid Small Cap
United Kingdom	FTSE 350 + Liquid Small Cap (incl. IOB)
Germany	Dax, MDax, TecDax + Liquid Small Cap
Switzerland	Swiss portion of STOXX Europe 600 (48 shares) + Liquid Small Cap
France	CAC Large Cap, CAC Mid Cap + Liquid Small Cap
Netherlands	AEX, AMS Mid Cap + Liquid Small Cap
Belgium	BEL 20, BEL Mid Cap + Liquid Small Cap
Spain	IBEX 35 + Liquid Small Cap
Portugal	PSI 20
Sweden	OMX Stockholm 30 + Liquid Small Cap
Finland	OMX Helsinki 25 + Liquid Small Cap
Denmark	OMX Copenhagen 30 + Liquid Small Cap
Norway	OBX
Czech	PX
Japan	Nikkei 225 + Liquid Small Cap
Hong Kong	HSI + Liquid Small Cap
Australia	ASX 200 + Liquid Small Cap
Singapore*	STI + Liquid Small Cap
South Africa	Top 40 + Liquid Small Cap

\*not available to Singapore residents

IB CFD margin efficiency can be superior to share-dealing margin. Commissions and margin interest are very low relative to other brokers. Pricing data comes directly from the underlying share on the exchanges and you can have the CFD and share next to each other on a line-by-line basis in Trader Workstation. Current leverage offered by Interactive Brokers to regular online accounts for trading equity CFDs is 5:1. If you are able to demonstrate to IB that you are an experienced trader, available CFD leverage can be increased to 10:1 for equities. Below is a Pros and Cons analysis of CFDs vs. Shares prepared by IB as of 19 July 2019:

BENEFITS of IBKR CFDs		DRAWBACKS of IBKR CFDs	
No stamp duty or financial transaction tax (UK, France, Belgium)		No ownership rights	
Generally lower commission and margin rates than shares		Complex corporate actions may not always be exactly replicable	
Tax treaty rates for dividends without need for reclaim		Taxation of gains may differ from shares (please consult your tax advisor)	
Exemption from day trading rules			

III. Cost and Margin Considerations

IBKR CFDs can be an even more efficient way to trade the European stock markets than IBKR's highly competitive stock offering.

Firstly, IBKR CFDs have low commissions compared to stocks, and the same low financing spreads:

EUROPE		CFD	STOCK
Commission	GBP	0.05%	GBP 6.00 + 0.05%*
	EUR	0.05%	0.10%
Financing**	Benchmark +/-	1.50%	1.50%

\*per order + 0.05% of excess over GBP 50,000  
 \*\*CFD financing on total position value, stock financing on borrowed amount

When you trade more, CFD commissions become even lower, as low as 0.02%. Financing rates are reduced for larger positions, to as low as 0.5%. Please see [CFD Commissions](#) and [CFD Financing Rates](#) for more details.

Secondly, CFDs have lower margin requirements than stocks. Retail clients are subject to additional margin requirements mandated by ESMA, the European regulator. Please see [ESMA CFD Rules Implementation at IBKR](#) for details.

	CFD	STOCK	
	All	Standard	Portfolio Margin
Maintenance Margin Requirement*	10%	25% - 50%	15%

\*Typical margin for blue-chips. Retail Clients are subject to a minimum Initial Margin of 20%. Standard 25% intraday maintenance margin for stocks, 50% overnight. Portfolio Margin shown is maintenance margin (incl. overnight). More volatile issues are subject to higher requirements

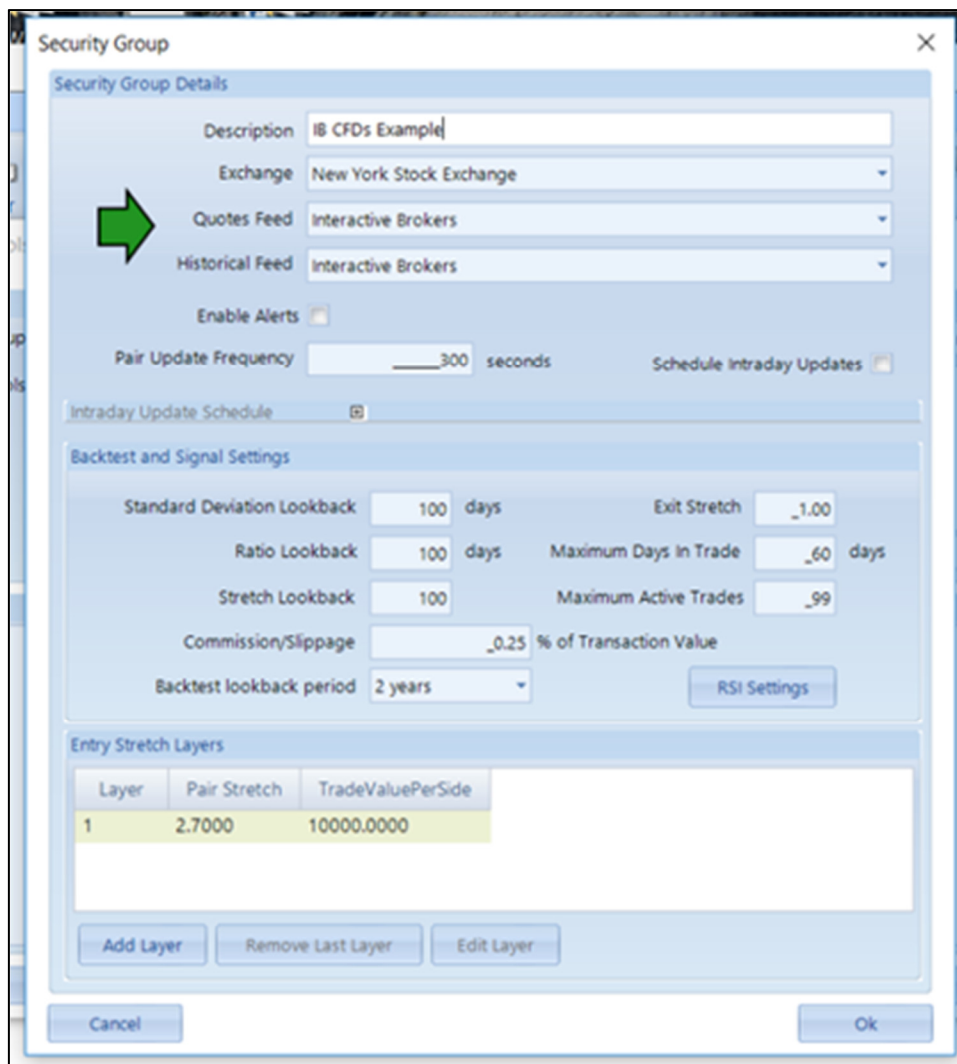
Please refer to [CFD Margin Requirements](#) and for more detail.

**NB:** CFDs are complex instruments and come with a high risk of losing money rapidly due to leverage. We recommend that you ensure you understand and are comfortable with the risks, and that you have robust risk management in place on your portfolio before considering using CFDs.

### Adding CFDs to Create Group in PTF PRO for Analysis and Semi-Autotrading

CFDs can be added to PTF PRO like any other type of security by ensuring you have PTF PRO integrated with IB TWS for datafeed and semi-autotrading. See sections 3.2 and 4.2 above.

Once you have done so, hit the Create Group button on the upper toolbar to bring up the Create Group screen. Ensure IB is selected as the datafeed for both Quotes Feed and Historic Feed:



**Security Group**

**Security Group Details**

Description: IB CFDs Example

Exchange: New York Stock Exchange

Quotes Feed: Interactive Brokers

Historical Feed: Interactive Brokers

Enable Alerts: ☐

Pair Update Frequency: 300 seconds

Schedule Intraday Updates: ☐

**Intraday Update Schedule**

**Backtest and Signal Settings**

Standard Deviation Lookback: 100 days

Ratio Lookback: 100 days

Stretch Lookback: 100

Commission/Slippage: 0.25 % of Transaction Value

Backtest lookback period: 2 years

Exit Stretch: 1.00

Maximum Days in Trade: 60 days

Maximum Active Trades: 99

RSI Settings

**Entry Stretch Layers**

Layer	Pair Stretch	TradeValuePerSide
1	2.7000	10000.0000

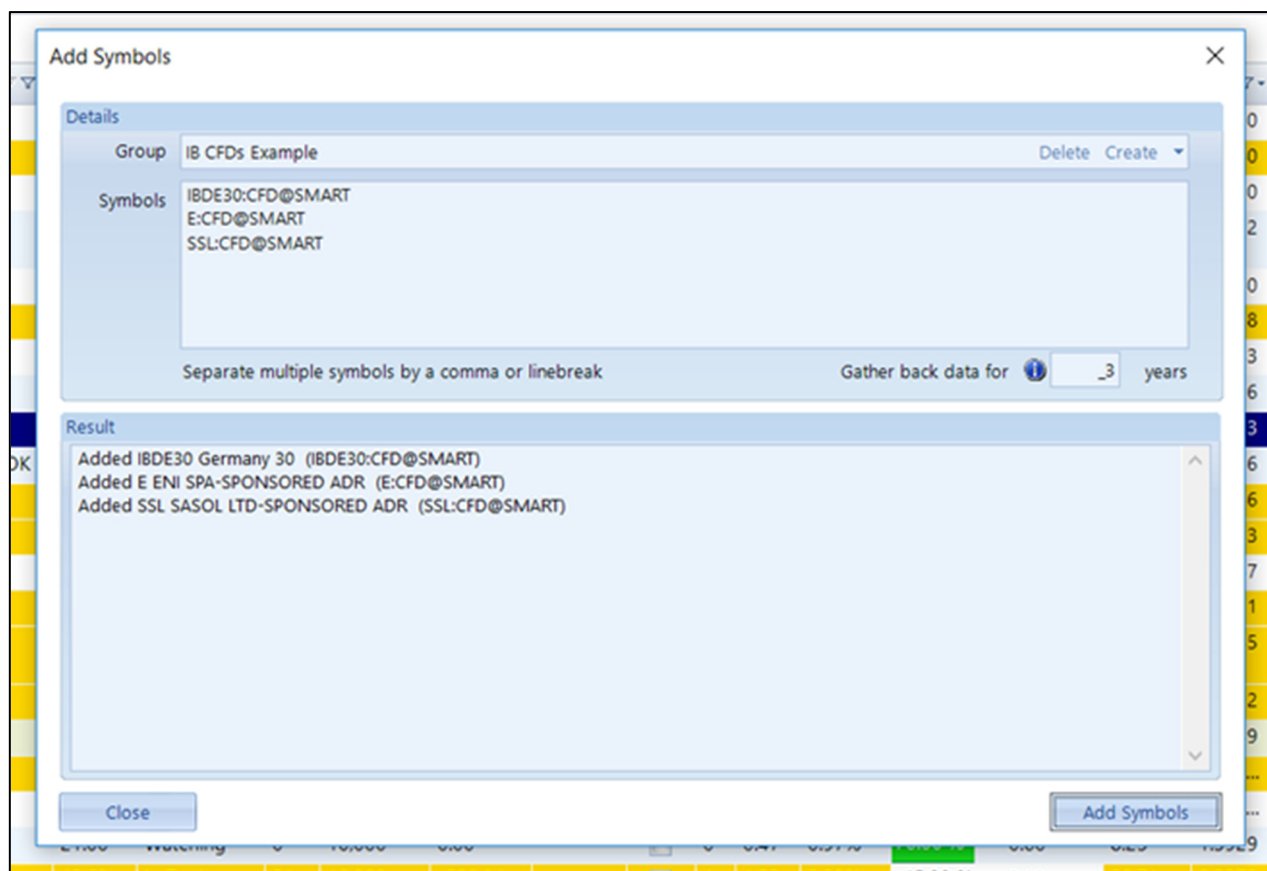
Add Layer Remove Last Layer Edit Layer

Cancel Ok

To add CFDs directly into the Group for analysis and semi-autotrading, you need to add the suffix :CFD@SMART to the ticker. For example:

<Underlying>:CFD@SMART

So for IBDE30 index, you would input IBDE30:CFD@SMART, for Eni SPA (symbol "E") CFD you would input E:CFD@SMART etc.:



IB CFDs are available on equities, indices and FX.



## 4 How to Get the Most Out of PairTrade Finder® PRO

### 4.1 Optimum Performance

PairTrade Finder® PRO is a powerful program. As far as we are aware, no other online pair trading software available crunches the same amount of data on-the-fly as PTF PRO. The latest programming technologies have been used to allow this crunching to happen in reasonable time. However, there are limits on the amount of data you can import and back test at any given time. The latest build of PRO v2.0 has significantly increased the speed and capacity of PTF PRO by a factor of 3X-5X over v1.38. This increase largely depends on your computer RAM, chip speed, hard drive speed, internet connection and how many other programs you have running on your computer.

PTF PRO can store and analyse more data than most trading software programs available. That is because we use separate a separate third-party software, Microsoft SQL, as a database for our data. PTF PRO connects to your SQL database automatically and updates it minute-by-minute, and quickly retrieves historical data from you database for backtesting. Due the volume of data PTF PRO crunches on-the-fly, you should be aware that there are some limitations involved.

Typically speaking, with PTF PRO v2.0 upgraded capabilities you should be able to easily store 500 pairs in your home page and backtest at least 60 symbols at once, perhaps up to 100. Note each symbol increase adds exponentially to the number of pair combinations. This expanded capacity of PRO v2.0 we believe is more than sufficient for a retail pair trader because you should be initially creating groups with 50 or less instruments to make sure there are of high fundamental correlation e.g. similar or same industry subsector, country and exchange, market cap, etc. To reduce the need for infinite processing power, we suggest you create a new group for each industry, instrument type, market capitalisation band (e.g. nano, micro, small, mid, large mega), country etc. With default 2.0 Entry/0.0 Exit settings, each pair will produce on average 3-4 trades per year, so with say 300 pairs, that is 900-1,200 Entry trading signals per year to be reviewed for action. Some users have powerful PCs and can comfortably store over 1,000 pairs on their home page and back test 100 or more stocks at once. However, if you find the program crashing during start up or during a back test, it is likely you have loaded too much data into the software. You will get an "out of memory" error pop up when this happens.

We have found the **optimum minimum system requirements** to be a brand name PC with:

Operating system - Windows 7 or higher

RAM - 8GB, with 2GB available solely for Trader Workstation if integrating with Interactive Brokers

Processor - minimum Intel i5 or higher, minimum QUAD CORE

Separate or External video card with at least 2GB of memory

Screen resolution 1280x1024

Solid-state disk (SSD)

Broadband internet connection - minimum 5 MB/sec.

**A note of caution:** When setting the Intraday update frequency in Group Settings, be careful using a high frequency like 5 seconds when having more than 200 pairs. By default, the update frequency is 300 seconds, meaning PTF PRO will fetch new data every 5 minutes. You might safely decrease this frequency to 60 seconds with 200 pairs on your home page. However, we do not recommend decreasing the Intraday Update Frequency below 60 seconds in any case.

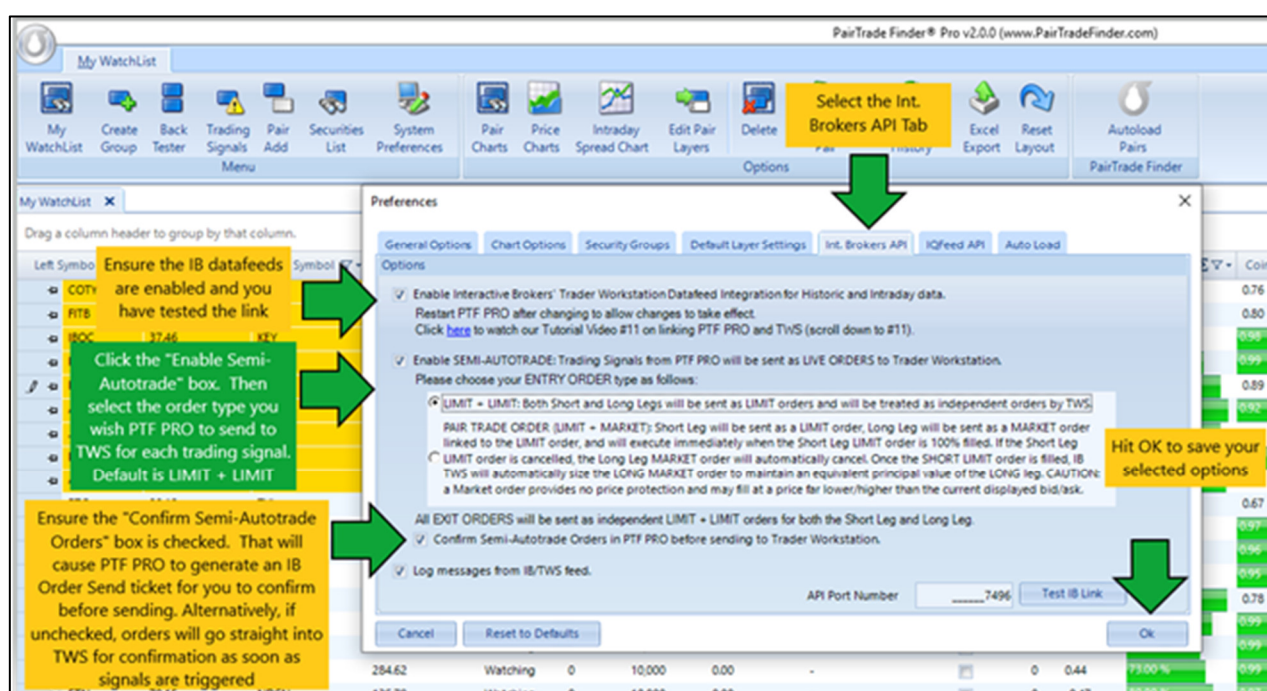
## 4.2 Semi-autotrading with PairTrade Finder® PRO & IB TWS

One of the most powerful features of PairTrade Finder PRO is its ability to integrate with Interactive Brokers for semi-autotrading ("Greybox trading"). To get the most out of your PTF PRO subscription, we highly recommend that you open an Interactive Brokers' account and activate this functionality, which will considerably improve your execution ease and speed.

For a video tutorial on IB data integration and semi-autotrading please click the link here:

<https://www.youtube.com/watch?v=qGI7kbnGdFs>

Once you have integrated PTF PRO to IB TWS for datafeeds (see section 3.2 above) you can now activate the semi-autotrade function. Go to System Preferences/Int. Brokers API tab. The screenshot below indicates the steps required:



There are two important elements to decide when enabling the semi-autotrade function i) the Order Type to be sent to IB TWS and ii) whether to toggle on or off the "Confirm Semi-Autotrade Orders in PTF PRO" box.

For i), please see section 4.3 below.

For ii), the decision is whether you wish to confirm each trade order to be sent by PTF PRO to TWS in PTF PRO before they show up in TWS. If you leave the box checked (Default is with box checked), for every trading signal generated PTF PRO will create an IB Order Send ticket as follows:

**Date and Time of generation of the IB Order send ticket**

**Actions/Trades being sent:**  
Buy to Close BAP and Sell to Close BSAC

**Upon clicking Send Trade, the trades summarised here will be immediately sent as Limit orders to IB TWS where you will see them in the PAI tab and where you will need to click Transmit on both for them to execute.**

**Type of Trading Signal and Order:**  
this ticket is for an Exit Signal

**Summary of the Trigger Settings that gave rise to the Order.** In this case the Exit Stretch of 0.00 sd was crossed, with the Ratio at 0.1137. The sd at the EOD Close was +0.22

**Sent as Limit Orders (per your PTF PRO semi-autotrade settings input above, at the Trading Signal prices, and with # of shares automatically calculated to match the Layer size (\$10k/leg in this example)**

**Click "Send Trade" to generate the trades in IB TWS API**

Once you then click on Send Trade, the trades will appear in the IB TWS API tab with exactly the parameters shown in the IB Order Send ticket:

**Look for the API tab in your IB TWS. All semi-autotrading trades will be sent here for confirmation**

**Symbols from IB Order Send and Exit Signal**

**Both sent as Limit Orders with number of shares as defined in the Exit Signals and IB Order Ticket. Order type determined by your semi-autotrade settings in the Int. Brokers API tab in System Preferences**

**Price per Exit Signal and resulting IB Order Ticket**

**Both trades must be individually reconfirmed in IB by hitting "Transmit"**

**Sell/Buy automatically determined based on the Exit Signal and as confirmed in the IB Order Send ticket**

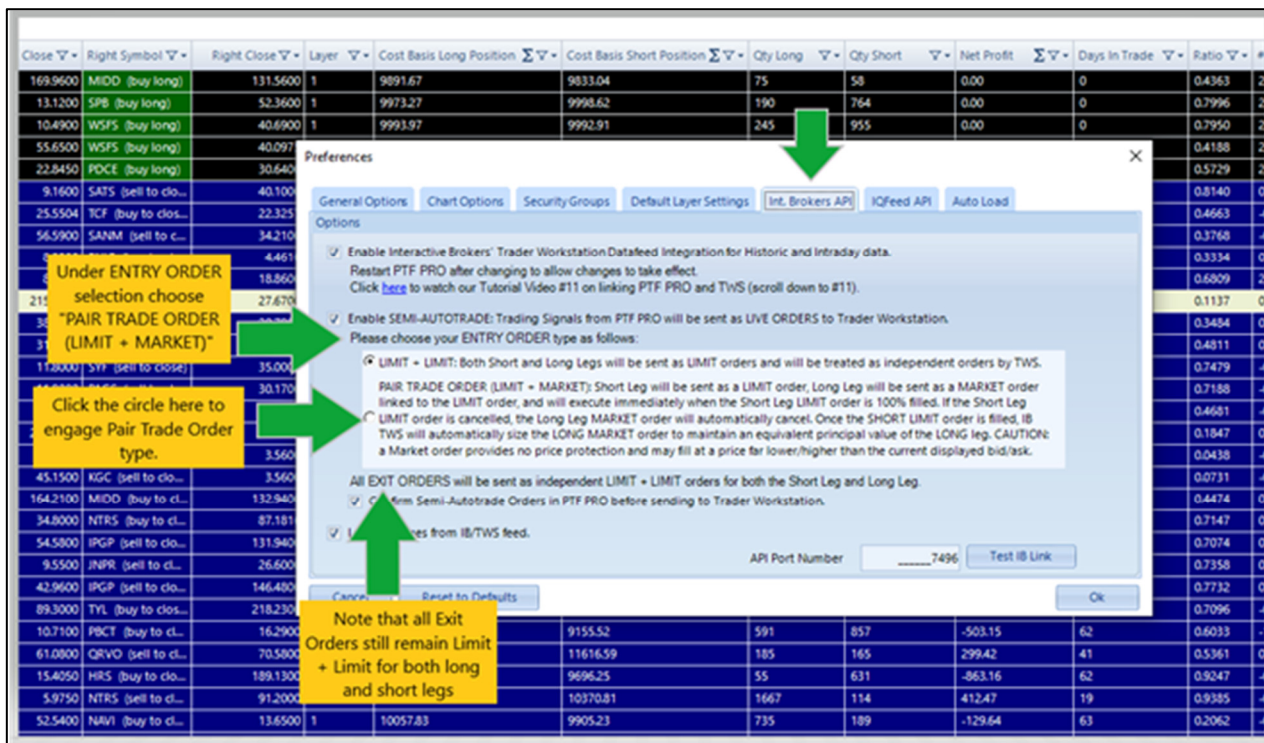
On Entry Trade IB Order tickets, if either of the shares in the Entry Signal are returned as "Hard to Borrow" from the IB API, this status will be highlighted in the ticket.

If you decide to uncheck the "Confirm Semi-Autotrade Orders in PTF PRO" box then you will NOT see the IB Order Send ticket in PTF PRO for confirmation. **Instead, PTF PRO will directly send the orders to IB TWS for confirmation there ONLY.** You will see the orders there as they are shown in the screenshot directly above. This option to leave the box unchecked bring PTF PRO as close as possible to autotrading, while still leaving the final decision on every order up to you in your brokerage account. We believe that the human element - which undertakes "sanity-checks" and news checks - should not be removed from systematic pair trading.



## 4.3 “Pair Trade” Order Type Activation in IB TWS

Another powerful new feature of PTF PRO v2.0 is the addition of the “Pair Trade” order type to its semi-autotrade capability. To engage this feature go to **System Preferences/Int. Brokers API**. Under the ENTRY ORDER TYPE section, click on the empty circle next to the paragraph on PAIR TRADE ORDER TYPE:



Under ENTRY ORDER selection choose “PAIR TRADE ORDER (LIMIT + MARKET)”

Click the circle here to engage Pair Trade Order type.

Note that all Exit Orders still remain Limit + Limit for both long and short legs

Preferences

General Options | Chart Options | Security Groups | Default Layer Settings | **Int. Brokers API** | IQFeed API | Auto Load

Options

☒ Enable Interactive Brokers' Trader Workstation Datafeed Integration for Historic and Intraday data. Restart PTF PRO after changing to allow changes to take effect. Click [here](#) to watch our Tutorial Video #11 on linking PTF PRO and TWS (scroll down to #11).

☒ Enable SEMI-AUTOTRADE: Trading Signals from PTF PRO will be sent as LIVE ORDERS to Trader Workstation. Please choose your ENTRY ORDER type as follows:

☒ LIMIT + LIMIT: Both Short and Long Legs will be sent as LIMIT orders and will be treated as independent orders by TWS.

☒ PAIR TRADE ORDER (LIMIT + MARKET): Short Leg will be sent as a LIMIT order, Long Leg will be sent as a MARKET order linked to the LIMIT order, and will execute immediately when the Short Leg LIMIT order is 100% filled. If the Short Leg LIMIT order is cancelled, the Long Leg MARKET order will automatically cancel. Once the SHORT LIMIT order is filled, IB TWS will automatically size the LONG MARKET order to maintain an equivalent principal value of the LONG leg. CAUTION: a Market order provides no price protection and may fill at a price far lower/higher than the current displayed bid/ask.

All EXIT ORDERS will be sent as independent LIMIT + LIMIT orders for both the Short Leg and Long Leg.

☒ Firm Semi-Autotrade Orders in PTF PRO before sending to Trader Workstation.

☒ Live Feeds from IB/TWS feed.

API Port Number: 7496 Test IB Link

Cancel Reset to Defaults Ok

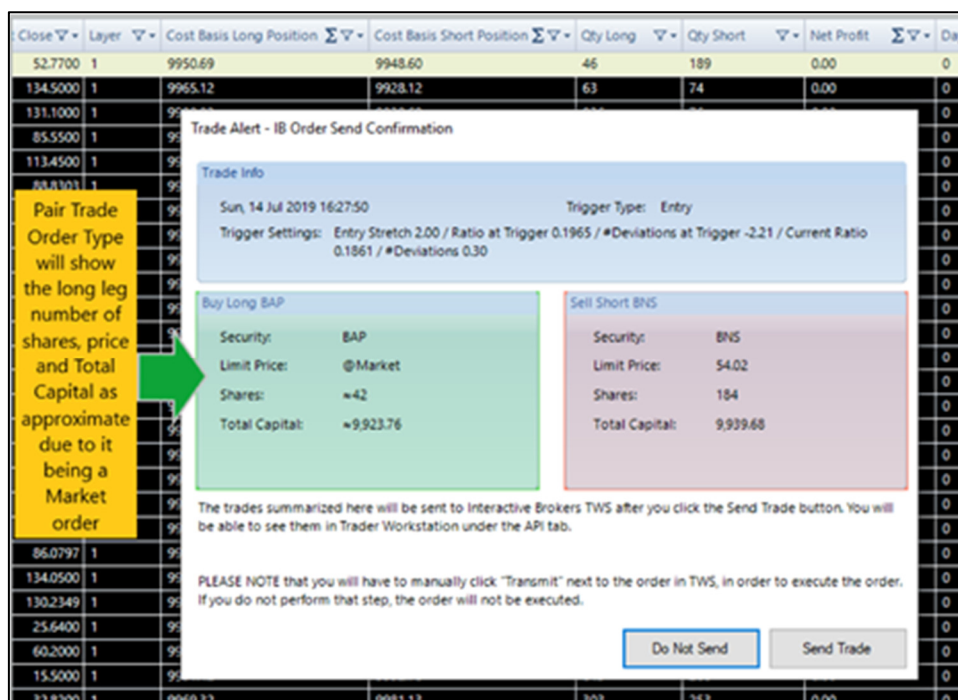
What is a Pair Trade Order type? Essentially, this order type allows you the quickest execution of a set of pair entry orders. The functionality is:

PAIR TRADE ORDER (LIMIT + MARKET): Short Leg will be sent as a LIMIT order, Long Leg will be sent as a MARKET order linked to the LIMIT order, and will execute immediately when the Short Leg LIMIT order is 100% filled. If the Short Leg LIMIT order is cancelled, the Long Leg MARKET order will automatically cancel. Once the SHORT LIMIT order is filled, IB TWS will automatically size the LONG MARKET order to maintain an equivalent principal value of the LONG leg. CAUTION: a Market order provides no price protection and may fill at a price far lower/higher than the current displayed bid/ask.

For a tutorial video and coverage of a LIVE pair trade order entry please see our video here:

<https://youtu.be/xDBmZOyta3k>

The IB Order Send ticket on a Pair Trade Order type will show the “Number of Shares”, “Price”, and “Total Capital” sections as being approximate as these are the subject of the price achieved in the Market order for the long leg:



Once you Send Trade to TWS, the trade setup on the TWS API will have the Long order linked as a conditional Market Order to the Short Limit Order and will look like this:

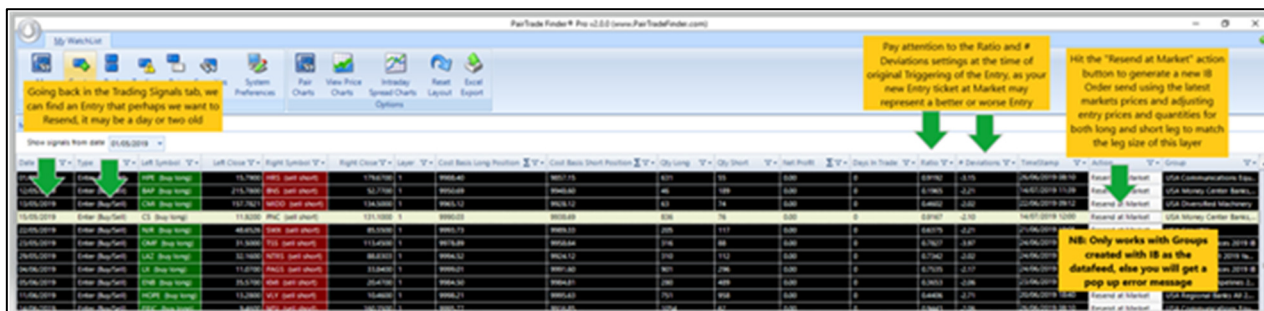


We find that using the Pair Trade Order type leads to lightning fast, one-click execution and represents an important enhancement of PTF PRO as a trading platform.



## 4.4 “Resend at Market” Function

Another important enhancement introduced recently into PTF PRO is the ability to access historic Trading Signals in the Trading Signals tab, see if they are still relevant to you to trade, and then hit “Resend at Market” in order to do so. The chart below shows you how:



Once you hit “Resend at Market” PTF PRO will generate an IB Order Send confirmation ticket with the current parameters of the pair based on the latest available market price data. You can review these parameters in real-time against the original parameters that created the Entry or Exit signal, to allow you to quickly and easily decide whether to send the trade to IB for execution:



Importantly, PTF PRO will automatically recalculate the number of shares for each leg (and each layer) based on your current leg and layer settings. This feature allows you to still undertake 1-click trade execution for historic trade signals, even possibly gaining better entry and exit points:



Please note this feature is only available for Trading Signals that were generated by pairs that use Interactive Brokers' data in Group Settings.

## 4.5 Trading Mentality Required

The personal attitude required to succeed in pair trading is the same attitude required to succeed in any other style of trading or anything else in life for that matter. Every trading system or style will have drawdowns and soft patches, that's the nature of the trading beast. There is not one trading system we are aware of that will produce profit, day in day out all the time (except Virtu's ultra-high-frequency algorithms co-located at exchanges at the time of their IPO). There will be times when market conditions aren't favourable for a particular trading style. A trader can and should seek to recognise and adapt their systems and styles to match the conditions on offer.

Anyone can handle winning trades. It's how you handle losing trades that matters. You can't control what happens, you can only control how you respond to what happens. The good thing with pair trading is naturally it has a high win rate around 70%, meaning 7 out of 10 trades will produce a profit. Having a high win rate makes it easier to stick to a strategy. That doesn't mean you can't have 3 losing trades in a row, and these losers can be significantly larger than the average winner. You inevitably will have this situation at some stage if you trade long enough. What matters is your performance after 50, 100 or more trades. Successful pair trading is a game of numbers. You need to treat your trading like a business where your losses are your business costs, are your wins are your business revenue. So long as you collect more revenue than costs after the quarter ends, you have a profitable trading business.

By default, many of us have been raised and educated to believe that if you do something and it is wrong, then you must change something. This reaction is a natural human reflex that is deeply ingrained in our psyche. It can also be detrimental to successful trading. Often in trading one ought to continue to use the same method even if it isn't working at the moment. This disconnect and its resulting cognitive dissonance is where most traders fail with trading systems. You can find a trading system with an excellent back test report and equity curve; however when the inevitable drawdown comes, the traders starts chopping and changing things or - even worse - completely abandons the method.

What you need to continue trading through a drawdown is confidence in your trading method. The advantage with pair trading is that it is designed around a very robust strategy with sound logic. Pair trading is not a fly-by-night strategy like many of the EAs and other junk that many online traders employ. It has been around since at least the 19th century and will continue to exist as long as liquid markets exist. It is not based on some voodoo combination of the MACD, RSI, chart pattern and day of the week filters. These technical indicator systems may sometimes produce good results. However, such trading systems aren't based on sound logic and when the inevitable drawdowns come, you will have no conviction to allow you mentally to continue trading them.

Successful pair trading, like anything else in life, requires planning, persistence and patience. You can't expect to become a millionaire overnight - it takes work and time to achieve. Plenty of practice and record keeping will help you get better at your craft. Try and learn as much as possible. Ask other successful pair traders questions and look for new ways to improve your trading. Pair trading is a method you can use to generate a consistent income and capital growth after you have mastered the basics.

If you are tired of chopping and changing your trading method, or looking for the non-existent holy grail, or sick of being promoted the latest "hot stock", then make it your objective to learn the pair trading method to the best of your ability. Be guided by our software and ongoing support. If you do, we believe you are significantly increasing your chances of becoming a successful trader and living a lifestyle about which most people can only dream.

Pair trading does work over time, as evidenced by the results in the backtester and in robust academic research. If you stick to it, you will succeed. The impatient and greedy will not.

## 4.6 Risk Management & Diversification

Paying attention to risk is of utmost importance in trading. You must ensure you won't take a drawdown below your psychological "uncle" point, for most traders this is 30%. After a 30% drawdown it becomes mentally hard to continue with the same method. Also, smart risk management ensures your account won't take a big hit if any one trade goes sour (M&A or other corporate action, scandal, fraud, other unsystematic risk on any one symbol). Every now and then you will take a large loss, this fact is part-and-parcel of trading, and something with which every trader must eventually contend.

### Position Sizing

The first thing you want to decide is how much of your account you want to place in each trade. This is a function of your risk tolerance and the maximum amount of positions you will allow. Ideally you will place between 5%-10% of your account in each trade. For example, if you had a \$10,000 account, you may wish to buy \$1,000 stock and short \$1,000 at a time. With 2:1 overnight margin, this will allow you to have a maximum of 10 pair trades open ( $10 \times 2,000 = \$20,000$ ). You will want some leverage headroom to allow for new excellent trades or unforeseen drawdowns. Ideally, try and measure the maximum loss a position could historically have generated (look at largest loss in backtest results), add a cushion, and then position size to ensure that that loss is not more than 1%-2% of your account equity.

For example, if on \$10k/leg a pair once had a \$1,600 loss, how much should we trade if our account is \$10,000? Well, let's say a possible maximum loss at \$10k/leg would be \$2,000 (cushion added). Our account is \$10,000 and we want to keep maximum risk (R) at max 2%. 2% of \$10,000 is \$200. So we would position size at \$1,000 leg (i.e. 10% of the leg size that has a max loss of \$2000 => max loss of \$200) and set a Max Loss Alert at \$200.

You may or may not want to use Max Loss Stop Losses. These are further discussed in section 4.7 below.

### Pairs Volatility

Before entering any Entry Trading Signal generated by PTF PRO we recommend you always revisit the Volatility chart and current Average Volatility reading (in last point of chart plot and in column on My Watchlist). The more volatile a pair, the smaller a position size you will need to assign to it in order to maintain your maximum risk exposure parameter at 1%-2% of account equity. The inverse is true will very stable (low volatility) pairs with a long track record – an increased position size may be warranted. As a rule of thumb with US mid and large cap stock pairs typical volatility is 1.0%-2.0%. Anything above 2.5% is an invitation to reducing position sizing, anything below 1.0% may warrant an increase.

### Derivatives Trading

When trading derivatives, use a small % of your account position sizing rule (to ensure total risk exposure 1%-2% for the possible loss). Don't over-leverage your account, the volatility in your trading account will become unbearable and dangerous. Remember the first rule of making money: DON'T LOSE MONEY. You must avoid large drawdowns. The first goal of any investment program is to preserve your capital, next is to reduce account volatility, then your aim is to grow your capital above the risk-free rate offered by bonds. Focus on not exposing your account to great risks and the growth will come naturally. Good trading is all about being defensive, conservative and taking calculated risks. After a 50% drawdown an account needs 100% return just to recover. Avoid this situation.



## Trading Costs

Pair trading has high trading costs: margin cost for leverage, buy/sell order for each leg of a trade, stock borrow fees, swing trading time horizons. With the small account size many new traders possess, keeping commissions and slippage at an absolute minimum is key – hence we look to Interactive Brokers as the best solution for helping get a new pair trader successfully into the game. Their minimum commission for a trade is only \$0.50 vs. over \$10 for many competitors. Margin rates and stock borrow fees are also much cheaper than most. For a small account, broker selection and trading costs can be the difference between success or failure.

## Diversification

Next, you want a diversified portfolio of pairs. We recommend you look for opportunities in as many markets and countries as possible and, if you are just trading stocks, trade companies from a variety of industries. Even better would be to trade multiple asset classes; stocks, futures, options and forex. You will need more trading capital and trading experience to trade multiple markets. If you are just beginning and have a small account, this expansion is something towards which you can work and prepare.

You have to be careful with what stocks you trade, unlike with futures and forex which are large, liquid instruments, some smaller cap stocks present much greater risks. For example, a large blue-chip company like Walmart (WMT) has significantly less risk (volatility) inherent in it than say a small cap biotechnology company traded on the NASDAQ which doesn't have any revenue and trades only 50,000 shares per day. You shouldn't short stocks like the second type. Where possible, stick to the largest and most liquid stocks only.

We also recommend that you don't have any symbol repeated in your live pair trade portfolio. Some symbols form multiple attractive pairs for trading and you may add a few of them onto My Watchlist together. They may all trigger at once. Select the best setup and trade that one only. Otherwise you have doubled your position size and risk (R) for that symbol.

Diversify across industry sub-sectors. As a rule of thumb, we don't like to have open more than two to three trades in any one industry-subsector at any one time.

Finally, be careful of the news surrounding stocks when trading. **Don't place a trade several weeks before an earnings announcement, or make sure you don't have a position during the announcement, because if a company surprises on delivered earnings compared to what analysts and market expected, the stock price can and often does move large amounts.** Use [Yahoo! Finance](https://finance.yahoo.com) and [earnings.com](https://www.earnings.com) to check for stock news and upcoming earnings announcement dates.

## 4.7 Whether to Use Max Loss Alerts & Stop Losses

Max Loss Alerts are a new feature of PTF PRO v2.0. For detail on how these alerts work and how to use them as stop losses and trailing stops, please see section 2.11.

The question of whether and what stop loss to use for reversion to mean trading is one that has been extensively debated. Possibilities suggested by traders over the years have been for:

1. dollar-based stop losses (i.e a Max Loss Stop Loss)
2. technically based stop losses (i.e. based on breach of a technical support or resistance level e.g. on the %age from Mean or absolute Ratio level)
3. volatility-based stop losses (i.e. based on the ratio widening out past x.xx sd, e.g. you enter a pair trade at -2.50 sd and set a stop at -3.50 sd. If the Ratio trades at greater than -3.50 sd you close the trade and take the loss)
4. time stops (i.e. Max Days in Trade)
5. many others, but these are the main ones.

In the end, your choice of stop loss(es) or not will depend on the instruments you trade, your risk tolerance as a trader, your style, your trading results and your analyses thereof.

### Leveraged Trading & Stop Losses

With any leveraged trading, we strongly suggest that traders use a stop loss from 1-3 above, even if it is wide and almost never hit. Unsystematic news risk on an equity (e.g. fraud, major lawsuit or scandal) or corporate actions (e.g. takeover bid) can cause a pair trade to blow out - often in an overnight gap - and not re-converge. You need to have a plan in place beforehand of how you will react to this event. With FX, an FX cross can trend for a very long time without reference to any underlying fundamental correlations, and leverage rates are higher. A failsafe stop loss to protect from a disastrous drawdown is, we believe, a prudent capital preservation strategy. **We also believe these risks can and should be mitigated first and foremost through small position sizing in your portfolio.**

### Dollar-Based Stop Loss

With the Max Loss Alert function in PTF PRO v2.0, you can easily set and directly follow a dollar-based stop loss strategy, closing a trade any time the Alert is triggered. You can also use it as a trailing stop to protect profits, again closing any trade that retraces to your trailing level.

### Technically Based Stop Loss

If you wish to use a technically based stop loss, it is up to you to define, backtest and follow backwards on the Pair Charts to see how it would have performed. You can use the Max Loss Alert to give you a heads up when a pair is going badly wrong so that you can then perform this analysis on your charts to see if your technical levels have been breached.

### Volatility-Based Stop Loss

If you wish to use a volatility-based stop loss strategy, PTF PRO also provides you with real-time recalculation of the # of deviations of the Ratio (Core Ratio actually) from its Mean at any time. With it, you can easily see if the pair is about to cross, or has crossed, a volatility-based stop loss based on standard deviation. Again, the Max Loss Alert can be used to flag your attention when losses that are

outside of your comfort zone have been reached. You can then review the sd level at the time of alert and compare it to your volatility stop trading rules. The Max Loss Alert (on screen and by email) contains the # of Deviations of the Ratio at the time of trigger.

## **Time Stop**

For pair trading in general, we also believe traders should set a time stop, e.g. Max Days in Trade that is in comfortably in excess of the Average Days in Trade for a pair (or in excess on Max Days in Trade over the backtest period) as any pair that is not reverting to mean over a long enough period is tying up capital in an unproductive fashion that can be reallocated to another more promising pair.

## **Conclusions**

As you can read, there are many possible stop loss rules you can devise for a trading system. We suggest paper trading with PTF PRO first for the first 10-20 trades at least, and then trading with small position sizes (0.5% of account equity at risk based on your Max Loss Stop Loss for example). As you get familiar with this style of trading, the markets and instruments that you trade, and the unforeseen corporate events and earnings surprises that can hit your portfolio, you will naturally gravitate towards a mental stop loss level. Then, based on 1-4 above, you can more easily define that level where you will say to yourself "any pair that trades past that point has violated my hypothesis that the Ratio will revert to its mean in a relatively short period of time and still at a profit". If a trader can make that statement with a high degree of confidence, the trade likely should be closed. At the end of the day, you need to be able to sleep comfortably at night, not worry about any single position, and be in the game for the long haul with capital preservation first and foremost in your mind.

## 5 Troubleshooting

### 5.1 Troubleshooting Installation Issues

Sometimes getting PTF PRO installed for the first time can be tricky. This difficulty isn't usually due to our software but rather the strict system requirements set by Microsoft SQL, the database program into which PTF PRO integrates. SQL is very strict because it is mostly used by companies which house sensitive data to which they do not want their employees to have access. Accordingly, one has to be the computer administrator for full rights to be able to install SQL correctly.

The current PTF PRO v2.0 Installer will automatically install Microsoft SQL Server 2012 Express LocalDB on your machine before installing PTF PRO if it does not detect that you have it already installed. It will also ensure that you have the latest version of Microsoft Visual C++ 2015 x64, which is required for PTF PRO v2.0 to perform correctly. If for any reason the PTF PRO Installer does not install Microsoft Visual C++ 2015 x64 correctly, you can download and install it manually [here](#).

If you experience any problems in installing PTF PRO on older versions of Windows, then please make sure you have the latest version of Microsoft .NET framework 4.5 installed on your machine. This .NET framework can be manually installed [here](#).

Please note only one license per computer is allowed, each machine's IP address is recorded to prevent transfer to another machine. To use PRO on more than one machine, you will need to purchase additional License Keys. Please email us at [admin@pairtradefinder.com](mailto:admin@pairtradefinder.com) should you need to do so. If you wish to migrate your License Key because you have upgraded or replaced your computer, email us at [admin@pairtradefinder.com](mailto:admin@pairtradefinder.com) and we will arrange for the migration.

#### **Using PTF PRO with your Mac and Parallels Hypervisor or Using PTF PRO on a Virtual Machine**

By default PTF PRO License Keys come with activation on hypervisors and virtual machines prohibited. Many users, however, run PTF PRO on Mac using the Parallels hypervisor ([www.parallels.com](http://www.parallels.com)) and many subscribers like to put PTF PRO on a standalone virtual machine instance to run 24/7. In either of these cases send us an email at [support@pairtradefinder.com](mailto:support@pairtradefinder.com) and we can enable your License Key for hypervisor and virtual machine activation by switching it to a "floating mode" of authentication.

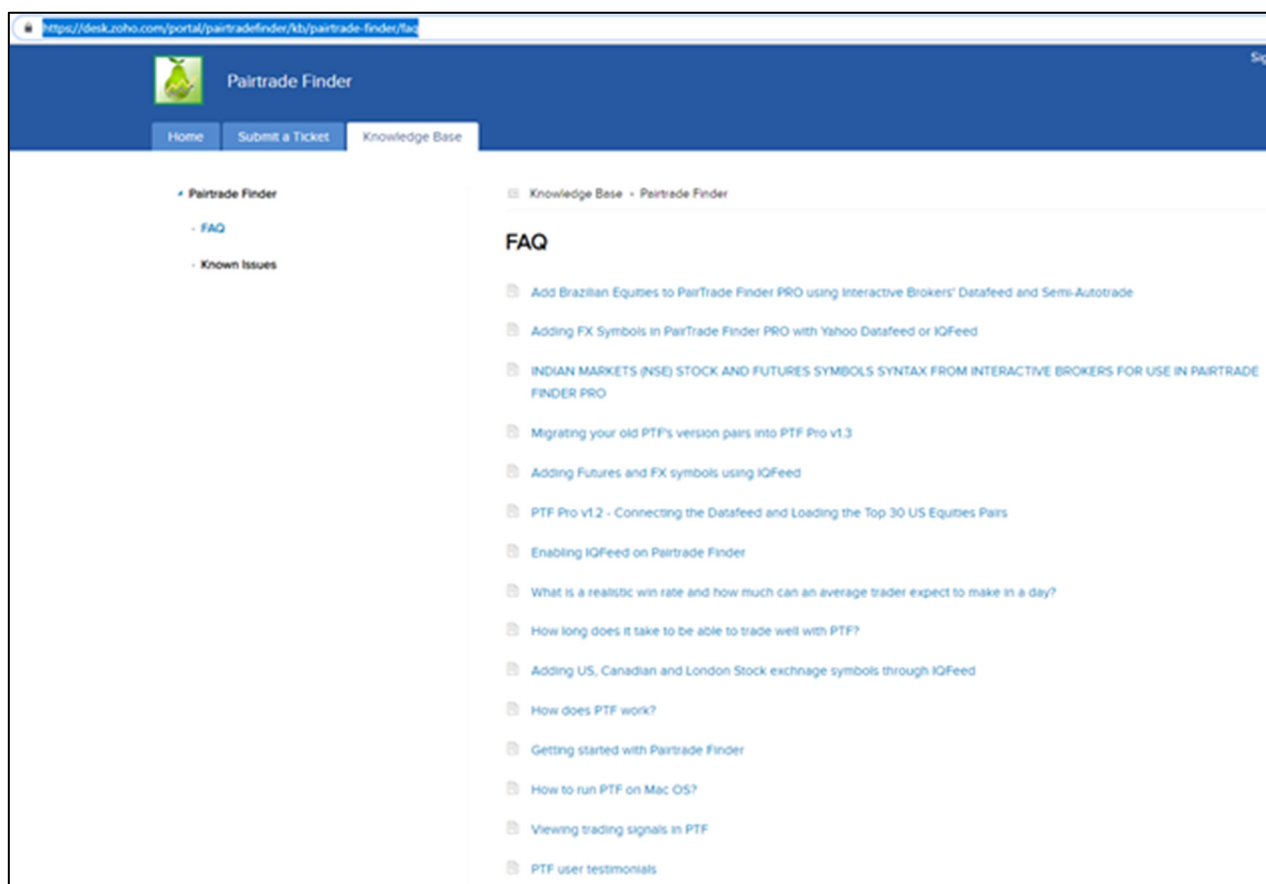
If you are having any other installation issues, please don't hesitate to contact us at [support@pairtradefinder.com](mailto:support@pairtradefinder.com) and we will respond to you quickly with a possible solution to your issue. If you require, we also offer remote installation of our software on your computer free of charge.

## 5.2 Troubleshooting Running Issues in PTF PRO

PairTrade Finder® PRO is a stable software program which has been used for over ten years amongst thousands of traders. Our latest build of PRO v2.0 is the most stable, fastest and most powerful version ever released.

Most user issues are due to local computer settings, datafeed connectivity, trading permissions or something the user has done out of the ordinary.

For many issues that may arise, you can find answers in our Knowledge Database at <https://desk.zoho.com/portal/pairtradefinder/kb/pairtrade-finder/faq>. Here is a preliminary list:



### Stock Code Imports and Date Formats

The most common issue with users from European or other non-US countries is not being able to add stock codes when using Create Group. This error may be due to your computer date format not being compatible with PTF PRO date format. To fix this issue, open your control panel, click on global and regional settings, then change your date format to MM/DD/YYYY and re-start PTF PRO and try again. If that doesn't work, try changing your date settings to DD/MM/YYYY and re-start again. Also, you may wish to change your default currency to \$ and use 2 decimal (.) places.

### PTF Freezes or Crashes During Start Up or Backtest

If you find your software crashing during start up or a backtest, or gives you an "Out of Memory Exception Error", you most likely have too many pairs saved in your home page or are back testing too many stocks at once. Due to the large amounts of data PTF PRO crunches, you need to be aware of your computer's and the software's respective limitations. See section 4.1 Optimum Performance above.



If you have any other issues running PTF PRO properly, please don't hesitate to contact us at [support@pairtradefinder.com](mailto:support@pairtradefinder.com) and we will endeavour to help you at the earliest convenience. Online support is available 24/6 and we endeavour to answer all requests in 24 hours, or a maximum of 48 hours. Usually, response time is much faster

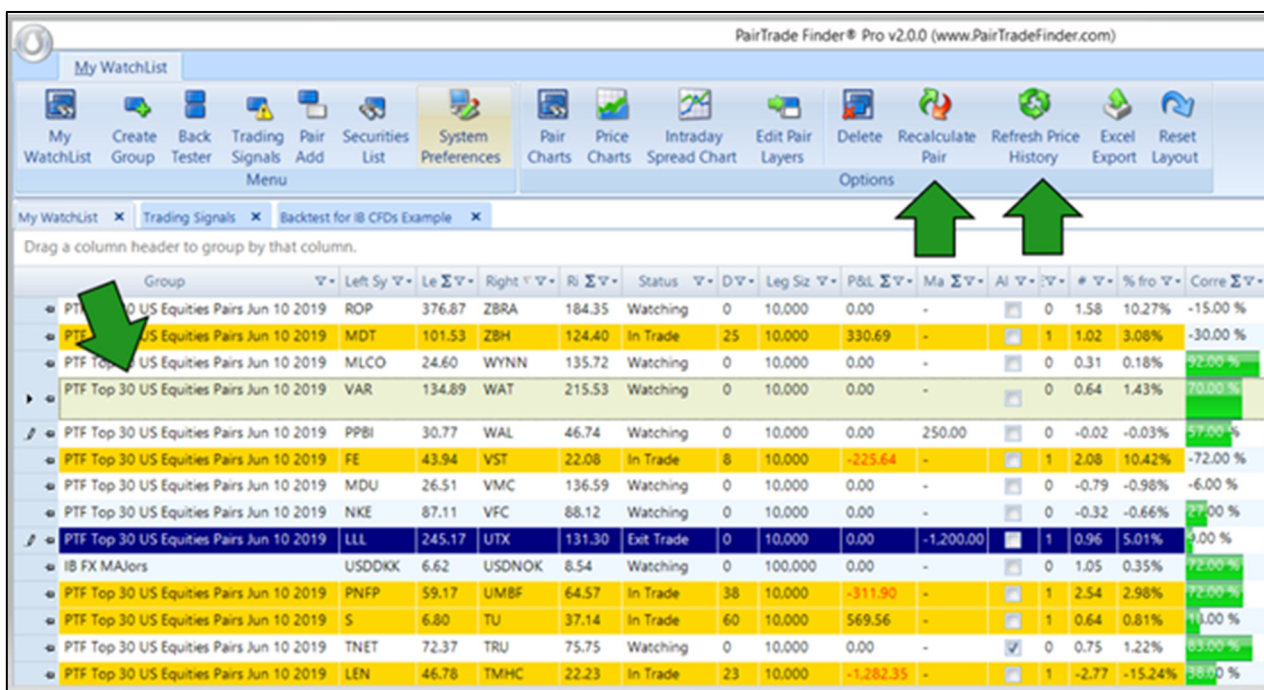
## 5.3 Troubleshooting Data Issues

By default PTF PRO uses free data automatically imported from Yahoo! Finance's Historic datafeed API. Data from Yahoo! Finance comes from CSI Data, a large, reputable data company. 99% of the time their data it is reliable, and even more so with large, liquid stocks. With smaller capitalisation stocks the data quality isn't as high - this degraded quality is real cost of free data.

If you want 100% reliable, clean data, we suggest you subscribe to a data subscription from IQfeed as per section 3.1 of this user manual, or open an Interactive Brokers' account and integrate PTF PRO to IB Trader Workstation per section 3.2.

If you see large spikes in your price charts, one or more of your stocks may have become corrupted. This corruption normally doesn't affect the trading signals, only the price chart. To fix this issue, go to My Watchlist, highlight the pair(s) and hit the "Refresh Data" button in the upper toolbar. If the problem persists, hit "Recalculate Pair" on the upper toolbar. "Recalculate Pair" will cause PTF PRO to reload the data for both symbols in the pair going back 10 years, and it will then replace all Trading Signals on that pair using the updated EOD Adjusted Close data that results from the update.

**NB: BE CAREFUL as any Trading Signals you may have been following from Intraday triggers will be removed.** If, after undertaking both of the above steps, the problem persists you will need to delete the pairs and the related stocks, then re-add the stocks back into the system.



Group	Left Sy	Le	Right	Ri	Status	D	Leg Siz	P&L	Ma	AI	#	% fro	Corre
PTF Top 30 US Equities Pairs Jun 10 2019	ROP	376.87	ZBRA	184.35	Watching	0	10,000	0.00	-	0	1.58	10.27%	-15.00 %
PTF Top 30 US Equities Pairs Jun 10 2019	MDT	101.53	ZBH	124.40	In Trade	25	10,000	330.69	-	1	1.02	3.08%	-30.00 %
PTF Top 30 US Equities Pairs Jun 10 2019	MLCO	24.60	WYNN	135.72	Watching	0	10,000	0.00	-	0	0.31	0.18%	92.00 %
PTF Top 30 US Equities Pairs Jun 10 2019	VAR	134.89	WAT	215.53	Watching	0	10,000	0.00	-	0	0.64	1.43%	70.00 %
PTF Top 30 US Equities Pairs Jun 10 2019	PPBI	30.77	WAL	46.74	Watching	0	10,000	0.00	250.00	0	-0.02	-0.03%	97.00 %
PTF Top 30 US Equities Pairs Jun 10 2019	FE	43.94	VST	22.08	In Trade	8	10,000	-225.64	-	1	2.08	10.42%	-72.00 %
PTF Top 30 US Equities Pairs Jun 10 2019	MDU	26.51	VMC	136.59	Watching	0	10,000	0.00	-	0	-0.79	-0.98%	-6.00 %
PTF Top 30 US Equities Pairs Jun 10 2019	NKE	87.11	VFC	88.12	Watching	0	10,000	0.00	-	0	-0.32	-0.66%	97.00 %
PTF Top 30 US Equities Pairs Jun 10 2019	LLL	245.17	UTX	131.30	Exit Trade	0	10,000	0.00	-1,200.00	1	0.96	5.01%	9.00 %
IB FX MAJors	USDDKK	6.62	USDNOK	8.54	Watching	0	100,000	0.00	-	0	1.05	0.35%	92.00 %
PTF Top 30 US Equities Pairs Jun 10 2019	PNFP	59.17	UMBF	64.57	In Trade	38	10,000	-311.90	-	1	2.54	2.98%	92.00 %
PTF Top 30 US Equities Pairs Jun 10 2019	S	6.80	TU	37.14	In Trade	60	10,000	569.56	-	1	0.64	0.81%	93.00 %
PTF Top 30 US Equities Pairs Jun 10 2019	TNET	72.37	TRU	75.75	Watching	0	10,000	0.00	-	0	0.75	1.22%	93.00 %
PTF Top 30 US Equities Pairs Jun 10 2019	LEN	46.78	TMHC	22.23	In Trade	23	10,000	-1,282.35	-	1	-2.77	-15.24%	98.00 %

Apart from the above, data is usually quite reliable and stable in PTF PRO. If you have a quality datasource, our software runs smoothly and efficiently.

If you have any other data issues, please don't hesitate to contact us at [support@pairtradefinder.com](mailto:support@pairtradefinder.com) and we will endeavour to help you at the earliest convenience

## 6 Other Information

### 6.1 Useful Links to Aide Your Pair Trading

<https://desk.zoho.com/portal/pairtraderfinder/kb/pairtrade-finder> - Our Knowledge Database with Frequently Asked Questions on PTF PRO and related trading issues.

<https://blog.pairtraderfinder.com/> - "Trade of the Month" detailed trade entry and exit analyses videos, educational series and general interest pair trading articles.

<https://blog.pairtraderfinder.com/pair-trading-resources/> - **Knowledge is power.** Our Resources section of our blog contains numerous articles and research studies on pair trading. If you are new to pair trading, we recommend you read the basic articles only. The advanced articles are for more seasoned pair traders with mathematical ability. Please note: you don't need to understand complex mathematics to successfully pair trade. With PairTrade Finder® PRO, we have taken the hard work out of the equation and made pair trading simple and easy.

[www.iqfeed.net/pairtraderfinder](http://www.iqfeed.net/pairtraderfinder) - Quality, reliable and clean data you can import into PTF PRO.

[www.mechtrading.com/qcollector/dtn/index.htm](http://www.mechtrading.com/qcollector/dtn/index.htm) - A cheap and simple program you can use with your IQfeed subscription to be able to download historical data into MSCII or CSV format, so you can import into other software programs or a spread sheet. You can download data in any time interval (1min, 18min, 1day, etc..) and going back 10 years for some instruments.

[www.yahoo.com/finance](http://www.yahoo.com/finance) - Possibly the best free finance website on the net, you can type in just about any code for any instrument around the world and pull up charts and conduct extensive analysis. Use Yahoo! Finance to check for any stock related news that may be affecting the price, upgrades/downgrades, earnings, takeovers, won/lost contracts, litigation, earnings guidance, CEO appearances etc.

[www.earnings.com](http://www.earnings.com) - A free service for traders to look up earnings announcement dates for US stocks. Remember, a pair trader does not want to place trades right before an earnings announcement...this website is a great place to check for the earnings calendar.

[www.interactivebrokers.com](http://www.interactivebrokers.com) - Possibly the best online broker in the world. Available to traders all over the world, you can trade over 126 different markets in 20 countries, all from one platform. IB has the cheapest overnight financing rates and commission fees versus all other online brokers.

This concludes the PairTrade Finder® PRO v2.0 User Manual.

We hope you enjoy using our software. We are certain that if you take the time and put in the effort to learn it, PTF PRO will be a valuable tool to improve your trading for many years to come. You have 15 days to use our software before the free trial will expire. After 15 days you will be unable to download another free trial as our system recognises your IP address and blocks it. You will need to purchase a subscription to a PTF PRO license key before your free trial is over to continue using our software.

With every subscription, you don't just get what we believe is the best pair trading software available, you also get access to extensive and valuable training materials and resources. Furthermore, you will receive free ongoing upgrades and support from a team of professional traders and programmers as long as you remain a paid-up subscriber.

If you have any questions or suggestions for us please don't hesitate to email us at [support@pairtradefinder.com](mailto:support@pairtradefinder.com) and we would be happy to help you.

We look forward to you becoming part of the large and growing online pair trading community.

**Happy Trading!**

Geoff Stuart Hossie, Paul Cuatrecasas and the team at [www.PairTradeFinder.com](http://www.PairTradeFinder.com)





**PairTrade Finder® PRO** is a service of Event Driven Investor Ltd.

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