USE OF THE STATISTICAL DATA

visualchart

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# ■ How to visualize the statistical results

The yield and effectiveness of a strategy can be measured in a detailed way, only by applying it in a chart and displaying the statistical. This will allow measuring the kindness of any investment method which will repel in a positive way in future investment applications.

In order to visualize the statistical results of a system, once it has been inserted on the chart of a concrete value, follows these steps:

1. Left click Charts in the Main Menu and then select the submenu systems and click the statistics menu (See screenshot).
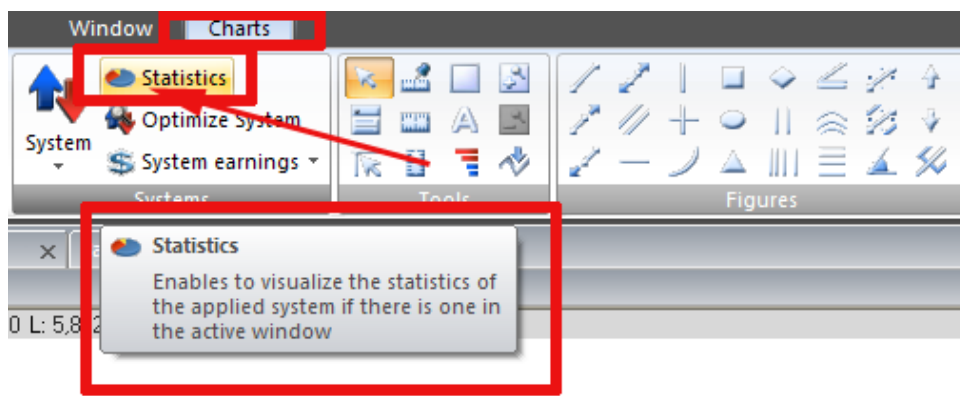
2. Select the statistical data you do want to display.
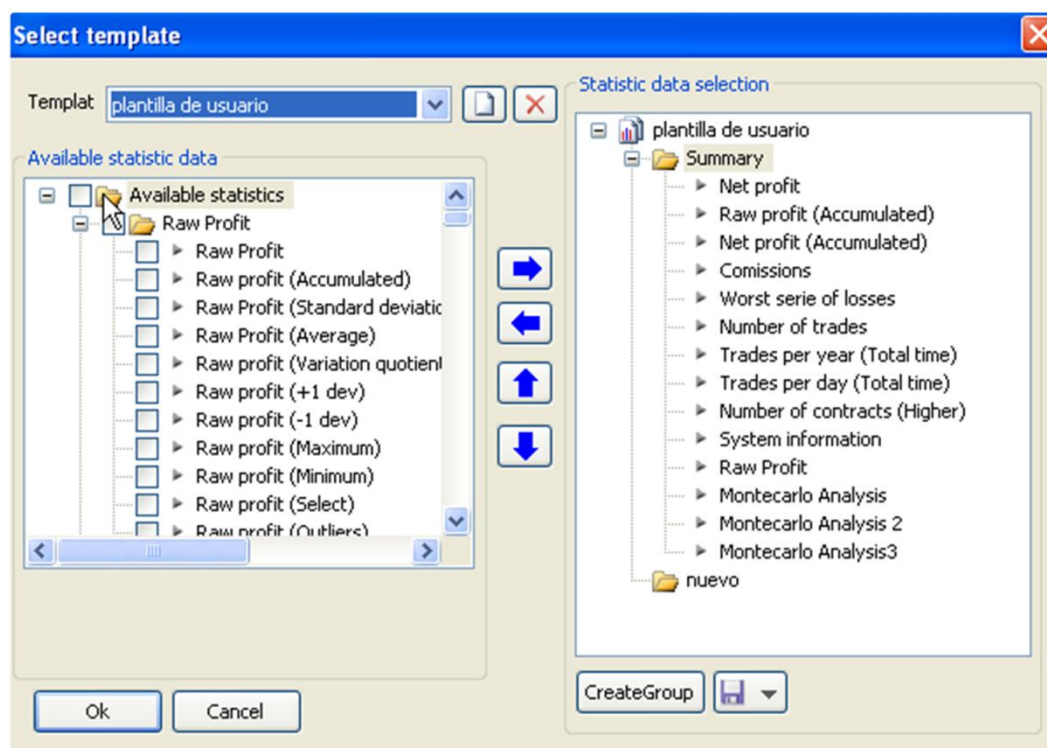
In the left side, all the statistical data will appear; this data can be calculated and put in order in different folders, depending on their nature.

To add statistical data, click the verification case on the left side of the statistical, for example ☑ ▸ Ganancia bruta and then the arrow ➡ .

To put in order the selected statistical data, select the corresponding field and then move it with the arrows ⬆ or ⬇ or ➡ to delete them.

Templates can be created too with the required statistical data. To do so click the icon, templates and groups are created by clicking CreateGroup , and the statistical data will be added in the corresponding groups and saved by clicking 💾▾ . This template will be available whenever you need it again:

To finish by clicking ⊠ you can delete the template.

◼ Representation of the statistical data

Each statistical data can be represented two different ways, in graphic representation or in numerical representation, corresponding with the tabs **Rep. Graf** and **Analysis by trades** which appear in top of the chart.

In the chart bellow we can see the statistical values over the analyzed period of time. In the numerical representation we can see every trade made by the system.

Chart representation.

Analysis by trades

◼ General information

In the main menu a new statistical flap will appear.
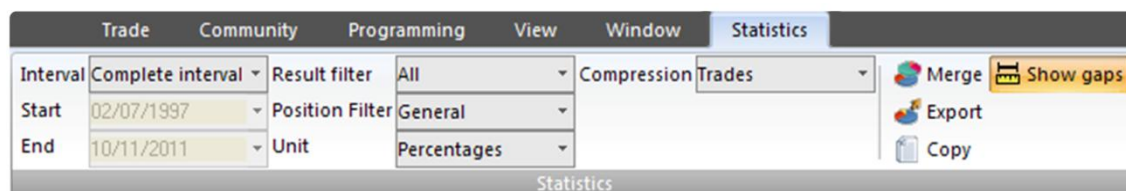
The First option to be chosen will be to select the interval where we want to apply the system statistics: complete interval, last day, last week, last month, last year or chose interval. If you select the option "chose interval" you will have to select the start data and end date.

We can filter the statistical data as well by the result of the trades where you will be able to chose: winners, losers, or all the trades.

Another available filter is by short or long trades.

In this unity, we offer three different formats, percentages, by points or by cash. Percentage offers the results in function of the system yields in percentage. By points counts the results of the system by counting the earning or loses in points (for index and futures. By cash shows the results of the systems, depending on the cash yields. By default the most outstanding aspects of the system are shown in percentage.

In the last option of this tab, the results of the statistics can be shown by trades, by days, by weeks , month or years.

◼ Statistical

Market Gain: Is the difference between the open of the First trade bar and the close of the last trade bar.

$$Market\ Gain\ = Open\ 1 - Close\ n$$

This data enables us to compare the system yield related to the market evolution over this period of time.

Market earning (Accumulate): GM_i is the market earning in the trade i.

$$Market\ earning\ (Accumulated) = \sum_{i=1}^{n} GM_i$$

The Accumulated Market Earning provides us with an objective data to be able to compare the system earnings along with the market earnings over the same period of time.

Commissions: Depending on the adjustments made upon the systems, commissions can be fixed in a percentage way (at the trade open/close price) or at a fixed number.

At the same time, the statistical data for commission analysis, can change, depending on the selected calculation unity (cash, points or percentage).

Case 1: Fixed commission, Money/Points

This is the simplest case. We want to calculate the Money or points paid to the broker , equal for all the trades. The formula will be as follow:

$$Paid = Comission * Value\ per\ Point * 2$$

Case 2: Percentage Commission, Monetary Unit/Points

We want to calculate the amount of Money or points that we have paid for each trade: The formula is as follow:

$$Paid = (Exit\ Poin + Entry\ Point) * ValuePer\ Point * 0.01 * Comission$$

Case 3: Percentage Unities

In this case we want to know our spends in commissions in a percentage way, related to the result of the trade.

ResSC would be the result of the trade without commissions and Res the real result of the trade

$$Paid = \frac{|ResSC| - |Res|}{|Res|}$$

Gross profit: Calculates the profit for each trade, without taking the commissions in to account.

Long Positions. It will be the difference between the exit price and the entry.

$$Gross\ profit = G = Exit\ price - Entry\ price$$

Short positions. It will be the difference between the entry price and the exit price

$$G = Entry\ price - Exit\ price$$

Gross profit (accumulated): Show the sum of the gross profit and the gross profit of the previous trades.

G_i being the profit of the trade i.

$$Acumulated\ Gross\ Profit = \sum_{i=1}^{n} G_i$$

Gross profit (Average): Shows the average profit of all the trades together.

$$Gross\ profit\ (Average) = \bar{G} = \frac{\sum_{i=1}^{n} G_i}{n}$$

The obtained data express the expected average profit for the system.

Gross profit (Standard Deviation): Shows the standard deviation of the gross profit for all the trades.

$$Gross\ profit\ (Standard\ Deviation) = \sigma(G)$$

$$\sigma(G) = \sqrt{\frac{\sum_{i=1}^{n}(G - \bar{G})^2}{n}}$$

To know more details about a Group of data, the knowledge of the averages main trend (as the case of the gross average profit), will not be enough, we need to know as well the deviation represented by the data upon their distribution towards the arithmetic average of that, with the aim to obtain a vision of them closer to the reality when interpreting them to take trading decisions.

Gross profit (Variation coefficient): Shows the variation coefficient of the Gross profit values.

$$\text{Gross profit (Variation coefficient)} = \frac{\sigma(G)}{\overline{G}}$$

The variation coefficient is useful while comparing dispersions in several time frames, because it is a measure which remains unchanged in front of changes of scale. On the other hand it presents several problems, because differently from the standard deviation, this coefficient is variable in front of source changes. This is why it is important to have all positive values and therefore it average will be a positive value.

Gross profit (+1 dev): Shows the value of the average gross profit plus a standard deviation.

$$\text{Gross profit } (+1\ dev) = G + \sigma(G)$$

In a normal distribution, this data determines the interval´s maximum extreme where most of the values are included. Therefore we can expect future earnings not to overcome this value.

Gross Profit (-1 dev): Shows the value of the average gross profit minus a standard deviation.

$$\text{Gross profit } (-1\ dev) = G - \sigma(G)$$

In a normal distribution, this data determines the interval´s minimum extreme where most of the values are included. Therefore we can expect future earnings not to under come this value.

Gross earning (High): Shows the maximum real value of the obtained gross profit.

$$Gross\ earning\ (Maximum) = Max(G_i\ ; i \leq n)$$

Gross earning (Low): Shows the minimum real value of the obtained gross profit.

$$Gross\ Earning\ (Low) = Min(G_i\ ; i \leq n)$$

Gross earning (Select): Shows the gross earnings values which are included amount the average (+/-) three standard deviations.

$$Gross\ earnings\ (Select) = \begin{cases} G & si \quad (G \leq \overline{G} + 3\sigma(G)\ ó\ G \geq \overline{G} - 3\sigma(G)) \\ n/a & in\ other\ case \end{cases}$$

In a normal distribution, the interval +/- three typical standard deviations enclose all the normal or typical values. If the profit of a trade is defined in this statistical data, it warms us that this is an expected value.

Gross earning (Outliers): Shows the gross earning values not shown by Gross earnings (Select), this means , the values superior to the average plus three standard deviations or lower than the average minus three standard deviation.

$$Gross\ profit\ (Outliers) = \begin{cases} G & si \quad (G > \overline{G} + 3\sigma(G)\ \acute{o}\ G < \overline{G} - 3\sigma(G)) \\ n/a & in\ other\ case \end{cases}$$

In a normal distribution, the interval outside +/- three standard deviations represent all the abnormal values. If the profit of a trade is defined in this statistical data, it warms us about the fact that it is an untypical profit.

Net profit: Calculates the net profit for each trade.

$$Net\ profit = GN = Net\ Profit - Comissions$$

The interpretation or application of this statistical data is derived from its homonym in the gross profit.

Net profit (Average): Displays the arithmetic average of the net profit for all the trades.

For $GN_i = Trade\ net\ profit\ i$.

$$Net\ profit\ (Average) = \overline{GN} = \frac{\Sigma_{i=1}^{n} GN_i}{n}$$

The interpretation or application of this statistical data derives from its homonym in the gross profit.

Net profit (Standard Deviation): Shows the standard deviation of the net profit for all the trades.

$$Net\ Profit\ (Standard\ Deviation\ ) = \sigma(GN)$$

$$\sigma(GN) = \sqrt{\Sigma_{i=1}^{n} \frac{\left(GN - \overline{GN}\right)^2}{n}}$$

The interpretation or application of this statistical data derives from its homonym in the gross profit.

Net profit (Variation coefficient): Shows the variation coefficient for the net profit valued.

$$Net\ Profit\ (Variation\ coefficient) = \frac{\sigma(GN)}{\overline{GN}}$$

The interpretation or application of this statistical data derives from its homonym in the gross profit.

Net Profit (+1 dev): Shows the average net profit plus a standard deviation.

$$Net\ Profit\ (+1\ dev) = GN + \sigma(GN)$$

The interpretation or application of this statistical data derives from its homonym in the gross profit.

Net Profit (-1 dev): Shows the net profit average minus a standard deviation.

$$Net\ Profit\ (-1\ dev) = GN - \sigma(GN)$$

The interpretation or application of this statistical data derives from its homonym in the gross profit.

Net Profit (Maximum): Shows the higher value of the net profit.

$$Net\ Profit(Maximum) = Max(GN_i\ ; i \leq n)$$

Net Profit (Minimum): Shows the lower value for the net profit.

$$Net\ Profit\ (Minimo) = Min(GN_i\ ; i \leq n)$$

Net Profit (Select): Shows the net profit values which are included between the averages (+/-) three standard deviation.

$$Net\ Profit\ (Select) = \begin{cases} GN & si \quad (GN \leq \overline{GN} + 3\sigma(GN)\ ó\ GN \geq \overline{GN} - 3\sigma(GN)) \\ n/a & in\ other\ case \end{cases}$$

The interpretation or application of this statistical data derives from its homonym in the gross profit.

Net Profit (Outliers): Shows the net profit values which are no shown in Net Profit (Select), this means, the values superior to the average plus three standard deviations, of inferior to the average minus three standard deviation.

$$Net\ Profit\ (Outliers) = \begin{cases} GN\ si\ (GN > \overline{GN} + 3\sigma(GN)\ \acute{o}\ GN < \overline{GN} - 3\sigma(GN)) \\ n/a \qquad\qquad\qquad in\ other\ case \end{cases}$$

The interpretation or application of this statistical data derives from its homonym in the gross profit.

Accumulated net profit: Shows the summatory of the net profit of a trade plus the net profit of the previous trades.

Being GN_i the net profit on the trade i.

$$Accumulated\ Net\ Profit\ = GNA = \sum_{i=1}^{n} GN_i$$

Accumulated Net Profit (Average): Shows the arithmetic average of the accumulated net profit, for all trades.

For $GNA_i = Accumulated\ net\ profit\ on\ the\ trade\ i$.

$$Accumulated\ Net\ Profit\ (Average) = \overline{GNA} = \frac{\Sigma_{i=1}^{n} GNA_i}{n}$$

Accumulated Net Profit (standard Deviation): Shows the standard deviation of the accumulated net profit for all trades.

$$Accumulated\ Net\ Profit\ (Standard\ Deviation) = \sigma(GNA)$$

$$\sigma(GNA) = \sqrt{\Sigma_{i=1}^{n} \frac{\left(GNA - \overline{GNA}\right)^2}{n}}$$

Accumulated Net Profit (Variation Coefficient): Shows the variation coefficient for the Accumulated Net Profit Values

$$Accumulated\ Net\ Profit\ (Variation\ Coefficient) = \frac{\sigma(GNA)}{\overline{GNA}}$$

Accumulated Net Profit (+1 dev): Shows the average of the accumulated net profit plus a standard deviation.

$$Accumulated\ Net\ Profit\ (+1\ dev) = GNA + \sigma(GNA)$$

Accumulated Net Profit (-1 dev): Shows the average of the accumulated net profit minus a standard deviation.

$$Accumulated\ Net\ Profit\ (-1\ dev) = GNA - \sigma(GNA)$$

Accumulated Net Profit (Maximum): Shows the highest result for the accumulated net profit.

$$Accumulated\ Net\ Profit\ (Maximum) = Max(GNA_i\ ; i \leq n)$$

Accumulated Net Profit (Minimum): Shows the maximum accumulated net profit .

$$Accumulated\ Net\ Profit\ (Minimum) = Min(GNA_i\ ; i \leq n)$$

Select net (Accumulated): These are the accumulated net profit values where, the added up values are the ones which their net profit is included between the average value of the net profit plus three standard deviations and the average value of the net profit minus three standard deviation.

$$G_i = profit\ i\ the\ trade\ i\ \ , \ \ \bar{G} = \sum_{i=1}^{n} G_i \ \ , \ \ \sigma = \sqrt{\frac{\sum_{i=1}^{n}(G-\bar{G})^2}{n-1}}$$

$$Select\ net\ (Accumulated) = \sum_{\substack{G_i < \bar{G} - 3\sigma \\ G_i > \bar{G} + 3\sigma}} G_i$$

Drawdown: Is defined as the trade with most potential losses over the duration of the trade :

$$BarMax = \begin{cases} Entry\ Bar & if\ Trade\ Close = CloseExitBar \\ ExitBar - 1 & in\ other\ case \end{cases}$$

$$BarMin = \begin{cases} Entry\ Bar & if\ TradeOpen = Open\ EntryBar \\ Entry\ Bar\ \ \ \ + 1 & in\ other\ case \end{cases}$$

$$Maximum = Max(Quote\ Between\ BarMax\ and\ BarMin)$$

$$Minimum = Min(Quote\ Between\ BarMax\ and\ BarMin)$$

If we are long.

$$Drawdown = DD = \begin{cases} Minimum - EntryPoint & if\ Minimum < EntryPoint \\ 0 & in\ other\ case \end{cases}$$

If we are short.

$$DD = \begin{cases} EntryPoint - Minimum & if\ Minimum > EntryPoint \\ 0 & in\ other\ case \end{cases}$$

But if we are on the case of $BarMax - BarMin < 0$

$$DD = \begin{cases} Trade\ Result & if\ Trade Result < 0 \\ 0 & in\ other\ case \end{cases}$$

This statistical data enables to evaluate each trade depending on the maximum amount of risk over the trade.

Drawdown (Accumulated): Shows the sum of the drawdown with all the drawdown values for previous trades.

For DD_i = Drawdown in the trade i,

$$Drawdown\ (Accumulated) = \sum_{i=1}^{n} DD_i$$

Drawdown (Average): Shows the arithmetic average for the drawdown values.

$$Drawdown\ (Average) = \overline{DD} = \frac{\sum_{i=1}^{n} DD_i}{n}$$

This statistical data enables to evaluate the average risk value suffered by each trade. It enables as well to determine in an objective way if it is an aggressive trade or not

Drawdown (Standard Deviation): Shows the standard deviation for the drawdown values.

$$Drawdown\ (Standard\ Deviation) = \sigma(DD)$$

$$\sigma(DD) = \sqrt{\sum_{i=1}^{n} \frac{\left(DD - \overline{DD}\right)^2}{n}}$$

As the distance measured with the standard deviation grows apart from the drawdown average value, then we can consider that the potential lose will change in relation to the average and therefore will be less significant. If the distance is short, then the potential losses are more homogeneous and a drawdown closer to the average drawdown is to be expected.

Drawdown (+1 dev): The average drawdown plus the standard deviation.

$$Drawdown\ (+1\ dev) = DD + \sigma(DD)$$

The interpretation or application of this statistical data derives from the the one exposed in the gross profit.

Drawdown (-1 dev): The drawdown average minus one standard deviation.

$$Drawdown\ (-1\ dev) = DD - \sigma(DD)$$

The interpretation or application of this statistical data derives from the one exposed in the gross profit.

Drawdown (Variation Coefficient): Shows the drawdown variation coefficient.

$$Drawdown\ (Variation\ Coefficient) = \frac{\sigma(DD)}{\overline{DD}}$$

The interpretation or application of this statistical data derives from the one exposed in the net profit.

Drawdown (Maximum): Shows the highest of the drawdown values.

$$Drawdown\ (Maximum) = Max(DD_i; i \le n)$$

Drawdown (Minimum): Shows the lowest of the drawdown values.

$$Drawdown\ (Minimum) = Min(DD_i; i \le n)$$

Run-up: Is defined as the potential gain (maximum possible gain) over the duration of each trade.

Being:

$$BarMax = \begin{cases} Exit\ Bar & if\ Close\ Trade = CloseExitBar \\ Exit\ bar - 1 & in\ other\ case \end{cases}$$

$$BarMin = \begin{cases} EntryBar & if\ TradeOpen = OpenEntryBar \\ EntryBar + 1 & in\ other\ case \end{cases}$$

$$Maximum = Max(Quote\ Between\ BarMax\ and\ BarMin)$$

$$Minimum = Min(Quote\ between\ BarMax\ and\ BarMin)$$

If we are long.

$$Runup = RU = \begin{cases} High - EntryPoint & If\ High > EntryPoint \\ 0 & in\ other\ case \end{cases}$$

If we are short

$$RU = \begin{cases} EntryPoint - High & If High < EntryPoint \\ 0 & in\ other\ case \end{cases}$$

But if we are in the case of $BarMax - BarMin < 0$

$$RU = \begin{cases} TradeResult & if\ TradeResult > 0 \\ 0 & in\ other\ case \end{cases}$$

Run-up (Accumulated): Shows the sum of the run-up value and all the previous trades run-up's.

For RU_i = Runup in the trade i,

$$Runup\ (Accumulated) = \sum_{i=1}^{n} RU_i$$

Run-up (Average): Shows the arithmetic average of the run-up values.

$$Runup\ (Average) = \overline{RU} = \frac{\sum_{i=1}^{n} RU_i}{n}$$

Run-up (Standard Deviation): Shows the standard deviation for the run-up values.

$$Runup\ (Standard\ Deviation) = \sigma(RU)$$

$$\sigma(RU) = \sqrt{\sum_{i=1}^{n} \frac{\left(RU - \overline{RU}\right)^2}{n}}$$

Run-up (+1 dev): Shows the average run-up plus a standard deviation.

$$Runup\ (+1\ dev) = RU + \sigma(RU)$$

Run-up (-1 dev): Shows the average run-up minus a standard dev.

$$Runup\ (-1\ dev) = RU + \sigma(RU)$$

Run-up (Variation Coefficient): Shows the run-up variation coefficient .

$$Runup\ (Variation\ Coefficient) = \frac{\sigma(RU)}{\overline{RU}}$$

Run-up (Maximum): Shows the run-up value .

$$Runup\ (Maximum) = Max(RU_i; i \le n)$$

Run-up (Minimum): Shows the run-up minimum value.

$$Runup\ (Minimum) = Min(RU_i; i \le n)$$

Number of bars: Determines the duration of each trade, defined in number of bars.

$$BarOp = BarCierre - BarApertura$$

Number of Bars (Accumulated): Sums all the number of bars used for all the trades.

For $BarOp_i =$ Number of bars in the trade $+ i$.

$$Number\ of\ bars\ (Accumulated) = \sum_{i=1}^{n} BarOp_i$$

Number of bars (Average): Shows the duration average in number of bars for the system trades.

$$Number\ of\ bars\ (Average) = \overline{BarOp} = \frac{\sum_{i=1}^{n} BarOp_i}{n}$$

Number of bars (Standard Deviation): Shows the standard deviation of the number of bars per trade.

$$Number\ of\ bars\ (Standard\ Deviation) = \sigma(BarOp)$$

$$\sigma(BarOp) = \sqrt{\Sigma_{i=1}^{n} \frac{\left(BarOp - \overline{BarOp}\right)^2}{n}}$$

This data enables us to check if the duration of the trades is similar to the average duration of each trade.

Number of Bars (+1 dev): Shows the average number of bars per trade plus a standard deviation.

$$Numero\ de\ barras\ (+1\ desv) = BarOp + \sigma(BarOp)$$

Number of bars (-1 dev): Shows the average amount of bars used for the trade minus the standard deviation.

$$Number\ of\ bars\ (-1\ dev) = BarOp - \sigma(BarOp)$$

Number of bars (Maximum): Shows the highest amount of bars used in one trade.

$$Number\ of\ Bars\ (Highest) = Max(BarOp_i; i \le n)$$

Number of bars (Minimum): Shows the minimum amount of bars used for one trade.

$$Number\ of\ bars\ (Minimum) = Min(BarOp_i; i \leq n)$$

Bars between trades: Shows the amount of bars gone by between two trades.

$$Bars\ Between\ Trades = BEN_i = OpenBar_i - CloseBar_{i-1}$$

Bars between trades (Accumulated): Shows the amount of bars accumulated between two consecutive trades.

$$Bars\ entre\ negocios\ (Acumulado) = \sum_{i=2}^{n} BEN_i$$

Bars between trades (Average): Shows the average amount of bars gone by between two trades.

$$Bars\ Between\ Trades\ (Average) = \overline{BEN} = \sum_{i=2}^{n} \frac{BEN_i}{n-1}$$

This data determines, therefore, the average waiting time between two trades.

Bars between trades (Standard Deviation): Shows the standard deviation of the number of bars between two trades.

$$Bars\ between\ trades\ (Standard\ deviation) = \sigma(BEN)$$

$$\sigma(BEN) = \sqrt{\Sigma_{i=2}^{n} \frac{\left(BEN - \overline{BEN}\right)^2}{n-1}}$$

Bars between trades (+1 dev): Shows the average amount of bars between trades plus the standard deviation.

$$Bars\ between\ trades\ (+1\ dev) = BEN + \sigma(BEN)$$

Bars between trades (-1 dev): Shows the average amount of bars between trades minus the standard deviation.

$$Bars\ between\ trades(-1\ dev) = BEN - \sigma(BEN)$$

Bars between trades (Maximum): Shows the maximum amount of bars between two trades.

$$Bars\ between\ trades\ (Maximum) = Max(BEN_i\ ; i \leq n)$$

Bars between trades (Minimum): Shows the minimum amount of bars between two trades.

$$Bars\ between\ trades\ (Minimum) = Min(BEN_i\ ; i \le n)$$

Entry Price: Shows the entry price for a trade.

Exit Price: Shows the exit price for a trade.

Entry Date: Shows the date where a trade starts.

Exit Date: Shows the date where a trade ends.

Entry Bar: Shows the bar where a trade starts.

Exit Bar: Shows the bar where a trade ends.

Entry Price (Opened Pos.): Shows the entry prices for the opened positions.

Entry Date (Opened Pos): Shows the date when the opened position where started.

Entry Bar (Opened Pos.): Shows the bars where the opened positions where started.

Buy /Sell (Opened Pos.): Shows if the opened positions are long ones or short ones.

Efficiency: The total efficiency shows the capacity of the trade to gain the maximum potential net profit over the system evaluation period.

The entry efficiency shows how a trade´s entry price gets closer to the best possible entry price.

The exit efficiency shows how a trade´s entry price gets closer to the best possible exit price.

$$Maximum = Max(Quote\ Between\ EntryBar\ and\ ExitBar)$$

$$Minimum = Min(Quote Between\ EntryBar\ and\ \ ExitBar)$$

$$EntryEff = \begin{cases} \dfrac{Maximum - EntryPrice}{Maximum - Minimum} & if \quad bullish \\ \dfrac{EntryPrice - Minimum}{Maximum - Minimum} & si \quad baja \end{cases}$$

$$ExitEff = \begin{cases} \dfrac{ExitPrice - Minimum}{Maximum - Minimum} & \text{if bullish} \\ \dfrac{Maximum - ExitPrice}{Maximum - Minimum} & \text{if bearish} \end{cases}$$

$$Eff = \frac{Trade\ Result}{Runup} EntryEff$$

The efficiency provides a variation measure of the quality of the trades, based on two objective data. On one side the relation between the potential profit and the real profit, on the other hand the maximum distance between prices, inside of the trade interval time frame and the maximum distance from the opening price.

The result is a value included between -1 and 1, interval which must be interpreted as the movement between the worse possible efficiency (-100% or -1) and the perfect efficiency (100% o 1).

From this explanation we can conclude that the closest the efficiency value is to 1, the more efficient the result of the trade has happened to be inside the trade time interval.

In this measure, the length between prices and the result of the trade (net profit) have the same weight.

According to this we can state that a long trade would be 100% efficient if it was started at the lower possible value and finished at the higher possible value, and in top of it, would have 0% commissions and slippage.

Entry efficiency: The entry efficiency shows how the entry price gets closer to the best possible entry price.

$$Maximum = Max(QuoteBetween\ EntryBar\ and\ ExitBar)$$

$$Minimum = Min(Quote\ Between\ EntryBar\ and\ ExitBar)$$

$$EntryEff = \begin{cases} \dfrac{Maximum - Entry\ Price}{Maximum - Minimum} & \text{if bullish} \\ \dfrac{EntryPrice - Minimum}{Maximum - Minimum} & \text{if bearish} \end{cases}$$

The simple interval is the same than in the total efficiency case (between -1 and 1), but in this case, only the distance between prices will be taken in to account.

Exit Efficiency: The exit efficiency shows how the trade exit price gets closer to the best possible exit price.

$$Maximum = Max(Quote\ between\ EntryBar\ and\ ExitBar)$$

$$Minimum = Min(Quote\ between\ EntryBar\ and\ ExitBar)$$

$$ExitEff = \begin{cases} \dfrac{ExitPrice - Minimum}{Maximum - Minimum} & if\ bullish \\ \dfrac{Maximum - ExitPrice}{Maximum - Minimum} & if\ bearish \end{cases}$$

The simple interval is the same than in the case of the total efficiency (between -1 and 1), but in this occasion only the distance between prices will be evaluated.

Efficiency (Accumulated): Shows the accumulated efficiency accumulated in the trades.

For Eff_i the efficiency in the trade i.

$$Eficiencia(Accumulated) = \sum_{i=1}^{n} Eff_i$$

Due to the fact that we are talking about an accumulated value, the simple interval will change for each independent case.

This data let us know if the efficiency of the low quality trades has been superior to the ones with high efficiency or, if, on the other hand, the quality of the trades with positive efficiency overcomes the ones with negative efficiency (Accumulated efficiency superior to 0)

Entry efficiency (Accumulated): Shows the entry efficiency accumulated within the trades.

For $EntryEff_i$ the entry efficiency within the trade i.

$$Entry\ Efficiency\ (Accumulated) = \sum_{i=1}^{n} EntryEff_i$$

Exit Efficiency (Accumulated): Shows the exit efficiency accumulated within the trades.

For $ExitEff_i$ the exit efficiency within the trade i.

$$Exit\ efficiency\ (Accumulated) = \sum_{i=1}^{n} ExitEff_i$$

Efficiency (Average): Shows the average efficiency of the trades.

$$Efficiency\ (Average) = \overline{Eff} = \frac{\sum_{i=1}^{n} Eff_i}{n}$$

As we are talking about the average value of the efficiency within the trades, this data is a representative simple and therefore could be considered as efficiency value for the system.

Entry Efficiency (Average): Shows the average entry efficiency for the trades.

$$Entry\ efficiency\ (Average) = \overline{EntyEff} = \frac{\sum_{i=1}^{n} EntryEff_i}{n}$$

Exit efficiency (Average): Shows the average exit efficiency for the trades.

$$Exit\ efficiency(Average) = \overline{ExitEff} = \frac{\sum_{i=1}^{n} ExitEff_i}{n}$$

Efficiency (Standard Deviation): Shows the standard deviation of the efficiency for the trades.

$$Efficiency\ (Standard\ deviation) = \sigma(Eff)$$

$$\sigma(Eff) = \sqrt{\frac{\sum_{i=1}^{n}\left(Eff - \overline{Eff}\right)^2}{n}}$$

The interpretation or application of this statistic data derives from the one exposed in gross profit.

Entry efficiency (Standard Deviation): Shows the standard deviation for the trade´s entry efficiency.

$$Entry\ Efficiency\ (Standard\ Deviation) = \sigma(EntyEff)$$

$$\sigma(EntryEff) = \sqrt{\frac{\sum_{i=1}^{n}\left(EntryEff - \overline{EntryEff}\right)^2}{n}}$$

Exit efficiency (Standard Deviation): Shows the standard deviation of the trade´s exit efficiency.

$$Exit\ efficiency\ (Standard\ deviation) = \sigma(ExitEff)$$

$$\sigma(ExitEff) = \sqrt{\frac{\sum_{i=1}^{n}\left(ExitEff - \overline{ExitEff}\right)^2}{n}}$$

Efficiency (Maximum): Shows the maximum efficiency of the trades.

$$Efficiency\ (Maximum) = Max(Eff_i\ ; i \leq n)$$

Entry efficiency (Maximum): Shows the maximum entry efficiency for the trades.

$$Efficiency\ (Maximum) = Max(EntryEff_i\ ; i \leq n)$$

Exit Efficiency (Maximum): Shows the maximum exit efficiency for the trades.

$$\text{Exit Efficiency}\ (Maximum) = Max(ExitEff_i\ ; i \leq n)$$

Efficiency (Minimum): Shows the minimum efficiency for the trades.

$$Efficiency\ (Minimum) = Min(Eff_i\ ; i \leq n)$$

Entry efficiency (Minimum): Shows the minimum entry efficiency for the trades.

$$Entry\ efficiency\ (Minimum) = Min(EntryEff_i\ ; i \leq n)$$

Exit efficiency (Minimum): Shows the minimum exit efficiency for the trades.

$$Exit\ efficiency\ (Minimum) = Min(ExitEff_i\ ; i \leq n)$$

Efficiency (Variation Coefficient): Shows the variation coefficient of the efficiency.

$$Efficiency\ (Variation\ coefficient) = \frac{\sigma(Eff)}{Eff}$$

The interpretation or application of this statistical data derives from the one exposed in the gross profit.

Entry efficiency (Variation Coefficient): Shows the variation coefficient for the entry efficiency.

$$Entry\ efficiency\ (Variation\ Coefficient) = \frac{\sigma(EntryEff)}{EntryEff}$$

Exit efficiency (Variation Coefficient): Shows the variation coefficient for the exit efficiency.

$$Exit\ efficiency\ (Variation\ Coefficient) = \frac{\sigma(ExitEff)}{\overline{ExitEff}}$$

Efficiency (+1 dev): Shows the variation coefficient average plus a standard deviation.

$$Efficiency\ (+1\ dev) = Eff + \sigma(Eff)$$

The interpretation or application of this statistical data derives from the one exposed in the gross profit.

Entry efficiency (+1 dev): Shows the entry average efficiency plus a standard deviation.

$$Entry\ efficiency\ (+1\ dev) = EntryEff + \sigma(EntryEff)$$

The interpretation or application of this statistical data derives from the one exposed in the gross profit.

Exit efficiency (+1 dev): Shows the average exit efficiency plus a standard deviation.

$$Exit\ efficiency\ (+1\ dev) = ExitEff + \sigma(ExitEff)$$

The interpretation or application of this statistical data derives from the one exposed within the Gross Profit.

Efficiency (-1 dev): Shows the average efficiency minus a standard deviation.

$$Efficiency\ (-1\ dev) = Eff - \sigma(Eff)$$

Entry efficiency (-1 dev): Shows the average entry efficiency minus a standard deviation.

$$Entry\ efficiency\ (-1\ dev) = EntryEff - \sigma(EntryEff)$$

Exit efficiency (-1 dev): Shows the average exit efficiency minus a standard deviation.

$$Eficiencia\ de\ salida\ (-1\ desv) = ExitEff - \sigma(ExitEff)$$

Montecarlo Analysis: A Montecarlo statistical is made up by several sub-statistical data, which are going to be used for the simulation Project. To calculate the statistical data, we are going to use an amount of symbols generated by a system. The Montecarlo simulation is a random process, over an amount of fixed iterations, based on considering the trades generated by the system.

For each iteration:

1. Considers the trades generated by the system.
2. Calculates all the implied sub-statistical.
3. Store the result of the statistical data.

With the data previously stored, we generate the Montecarlo report which is made up by the following element for each sub-statistical.

- Value on the system: The result of the statistical data calculated in base of the trades generated by the original system.
- Montecarlo Results: We will calculate on the results of each iteration of the simulation process:

  - Arithmetic average.
  - Trust interval: The average ± 3 * standard deviation.
  - Suggested value: The worst case (worst result) obtained.
  - The chart of the normal distribution followed by the statistical data.

This analysis is used as well to calculate the system´s risks. The trust interval offers and idea about where the statistical data we are analysing are moving and where they are expected to move. It shows as well the worst value of this statistical and a random result of all the statistical historical data.

Montecarlo Analysis 1: Carries out the Montecarlo analysis with the following statistical: Net Profit, Losses series, profit series, worst losses series, best profit series, Net Profit (Select), Net Profit (Outliers), Regression coefficient and Number of Bars.

Montecarlo Analysis 2: Carries out the Montecarlo analysis with the following statistical: Run-up, Drawdown, Efficiency, Entry efficiency, Exit Efficiency and Market Profit.

Montecarlo Analysis 3: Carries out the Montecarlo analysis with the following statistical: Gross Profit, Entry Price, Exit Price, Number of contract/shares, RINA index, Commissions y volatility.

Commissions (Accumulated): Shows the accumulated commissions.

For $Comissions_i$ the commissions on the trade i.

$$Comissions\ (Accumulated) = \sum_{i=1}^{n} Comissions_i$$

Ratio: Accumulated Commissions/Accumulated Net profit:
Shows the relation between the accumulated commissions and the accumulated net profit.

$$Ratio = \frac{Comissions\ (Accumulated)}{Accumulated\ Net\ Profit}$$

Number of trades (Opened Pos.): Shows the amount of opened positions.

Number of bars (Opened Pos): Shows the amount of bars accumulated by the opened positions.

Net Profit (Opened Pos): Shows the net profit for each of the opened positions.

Accumulate Net Profit (Opened Pos): Shows the sum of the net profit for all the opened positions.

Ratio: Accumulated Net Profit (Opened Pos)/ Accumulated Net Profit: Shows the relationship between the opened positions net profit and the currently accumulated net profit.

$$Ratio = \frac{Accumulated\ Net\ Profit\ \ (Opened\ Pos)}{Accumulated\ Net\ Profit}$$

Average Net Profit (Opened Pos.): Shows the average net profit for the opened positions.

Ratio: Average Net Profit (Opened Pos.)/ Average Net Profit: Shows the relationship between the average net profit of the opened positions and the average net profit per trade. If the system profit number is positive then the higher this ratio value the higher the system earnings power.

$$Ratio = \frac{Average\ Net\ Profit\ (Opened\ Pos.)}{Average\ Net\ Profit}$$

Earnings per year (Negotiated time): Shows the average net profit per year and negotiated time.

By using: $AverageMarketDaysPerYear = 252, MinutesPerDay = 1440$,

$n = Number\ of\ trade\ and\ negotiation\ time\ in\ minutes.$

$$\text{Earnings per year (Negotiated time)} := \frac{Net\ Profit * 252 * 1440}{NegotiatedTime}$$

Earnings per month (Negotiated Time): Shows the monthly average net profit per negotiated time.

$$\text{Earnings per month (Negotiated Time)} := \frac{Yearly\ Profit (Negotiated\ time)}{12}$$

Earnings per Week (Negotiated Time): Shows the weekly net profit per negotiated time.

By using: $MinutesDay = 1440$, $n = Number\ of\ trades$ and NegotiatedTime in minutes.

$$Earnings\ per\ Week (Negotiated\ Time) = \frac{Net\ Profit * 5 * 1440}{Negotiated\ time}$$

Earnings per Day (Negotiated Time): Show the daily net profit per negotiated time.

Taking: $MinutosDay = 1440$, $n = Number\ of\ trades$ and Negotiated Time

$$Earnings\ Per\ Day\ (Negotiated\ Time) = \frac{Net\ Profit * 1440}{NegotiatedTime}$$

Earnings per Year (Total Time): Shows the average yearly profit.

$$Earnings\ Per\ Year\ (TotalTime) = \frac{Net\ Profit}{number\ of\ years}$$

Earnings per Month (Total Time): Shows the average monthly profit.

$$Earnings\ per\ Month\ (Total\ Time) = \frac{NetProfit}{number\ of\ months}$$

Earnings per Week (Total Time): Shows the average weekly profit.

$$Earnings\ per\ Week\ (Total\ Time) = \frac{NetProfit}{Number\ of\ Weeks}$$

Earnings per Day (Total Time): Shows the average daily profit.

$$Earnings\ per\ Day\ (Total\ Time) = \frac{Net\ Profit}{Number\ of\ Days}$$

Continuity Groups: We call continuity groups the series of X consecutive trades, all winners or losers.

They are grouped by number of trades and signs. Ex., Group of three consecutive negative trades.

For each Group we present the following information:

- Average Profit: Group´s average profit. The sum of the profits of each group's series divided by the number of series.
- Average Net profit of the following group: Average of the profits which broke each series' Group
- Maximum /Minimum Profit: Shows the maximum (or minimum, depending on the sign (long/Short) of the group) earning of the series forming the group.
- Number of Series: Amount of times that a continuity Group of this type has appeared.

For each serie, of each Group the following information is presented:

- Profits: Serie Average Profit
- Next Profit: Profits of the trade which broke the serie.
- Accumulated Profit: Profit accumulated by the serie
- Start: Date when the serie was started
- End: Date when the serie was finished

Worst continuity group: Shows the profit of the less profitable continuity group.

Best Continuity group: Shows the profit of the most profitable continuity group**.**

Days since maximum profit: Shows the amount of days passed by since the day where the maximum profit was obtained.

Days since minimum profit: Shows the amount of days passed by since the day where the minimum profit was obtained.

Days since maximum profit (Accumulated): Shows the amount of days passed by since the day when the accumulated net profit was at its highest point.

Days since minimum profit (Accumulated): Shows the amount of days passed by since the day when the accumulated net profit was at its lowest point.

Days since maximum profit (Average): Shows the average of the days passed by since the profit was at its highest point.

Days since minimum profit (Average): Shows the average of the days passed by since the profit was at its lowest point.

Trades Time: Show the time which each trade lasts.

Trades Time (Maximum): Shows the maximum duration time of a trade.

For T_i duration time of the trade i.

$$Trade\ Time(Maximum) = Max(T_i\ ; i \leq n)$$

Trades Time (Accumulated): Shows the time accumulated by the trades.

$$Trades\ Time\ (Accumulated) = \sum_{i=1}^{n} T_i$$

Trades Time (Average): Shows the average time per trade.

$$Trade\ Time\ (Average) = \sum_{i=1}^{n} \frac{T_i}{n}$$

Time between trades: Shows the time expend between the trade i and $i - 1$, TEN_i.

Time between trades (Maximum): Shows the maximum amount of time expend off market between trades.

$$Time\ between\ trades\ (Maximum) = Max(TEN_i\ ; i \leq n)$$

Time between trades (Accumulated): Shows the time accumulated of market.

$$Time\ Between\ Trades\ (Accumulated) = \sum_{i=2}^{n} TEN_i$$

Time Between Trades (Average): Shows the average time expend of- market between trades.

$$Time\ between\ trades\ (Average) = \frac{\sum_{i=2}^{n} TEN_i}{n}$$

Number of trades: Total number of, n. Trades.

Trades per year (Negotiated Time): Dhows the yearly number of trades per negotiation time.

By taking: $AverageQuoteDayYear = 252$, $MinutesDay = 1440$,

$n = Number\ of\ Trades\ and\ \ Negotiated$ Time in minutes.

$$Trades\ Per\ Year\ (Negotiated\ Time) = \frac{n * 252 * 1440}{Negociated\ Time}$$

Trades Per month (Negotiated Time): Shows the amount of monthly trades per negotiated time.

$$Trades\ Per\ Month\ (Negotiate\ Time) = \frac{TradesYear(NegotiatedTime)}{12}$$

Trades Per Week (Negotiated Time): Shows the maximum amount of weekly trades per negotiated time.

By taking: $MinutesDay = 1440$,
$n = Number\ of\ Trades\ and\ Negotiated\ Time$ in minutes.

$$Trades\ per\ Week\ (Negotiated\ Time) = \frac{n * 5 * 1440}{Negotiated\ Time}$$

Trades Per Day (Negotiated Time): Shows the number of daily trades per negotiated time.

By Taking: $MinutesDay = 1440$,
$n = Number\ of\ Trades\ and\ Negotiated\ Time$ in minutes.

$$Trades\ Per\ Day\ (Negotiated\ Time) = \frac{n * 1440}{Negotiated\ Time}$$

Trades per year (Total Time): Average yearly trade number.

$$Trades\ Per\ Year = \frac{n}{Number\ of\ years}$$

Trades per month (Average): Average number of trades per year.

$$Trades\ per\ month = \frac{n}{Number\ of\ months}$$

Trade per Week (Average Time): Average number of trades per week.

$$Trades\ per\ week = \frac{n}{Number\ of\ trades}$$

Trades per Day (Average time): Average number of trades per day.

$$Trades\ per\ Year = \frac{n}{Number\ of\ days}$$

Shows the time spent in the market.

Total Time: Shows the total time.

Serie of losses: Shows the accumulated losses, this means that, an earning will be added to the value if this sum is positive, if it is negative the serie of lose will be equal to 0.

$$G_i = Earnings\ in\ the\ trade\ i$$

$$SerieOfLosses_i = \begin{cases} SerieOfLosses + G_i & if\ SerieOfLosses_{i-1} + G_i < 0 \\ 0 & in\ other\ case \end{cases}$$

Worst serie of losses: Shows the minimal value of the series of losses, all over the trades.

$$WorstSerieOf\ losses_i = Min(SerieOfLosses\ ; j \le i)$$

Series of profits: Shows the accumulated earnings, this means, a sum is added to the value if this sum is positive, if it is negative the series' value is 0.

$$G_i = Trade\ Earning\ i$$

$$SerieEarnings_i = \begin{cases} SerieEarnings_{i-1} + G_i & if\ SerieOfEarnings_{i-1} + G_i > 0 \\ 0 & in\ other\ cases \end{cases}$$

Best Series of Earnings: Shows the highest value reached by the series of earnings, all over the trades.

$$Best\ Serie\ of\ Earnings_i = Max(SerieEarnings_j\ ; j \le i)$$

Ratio: Long/Short: Shows the relationships between the benefits in shorts positions and in long ones.

This coefficient is variable in terms of change of sources, this is the reason why, its value provide more information when all the values are positive ones.

If the system earnings number is positive as much in long positions as in shorts ones, then, if the ratio is higher than 1, the system offers better warranties for long positions and, on the other hand is its value

is lower than 1, then the system will offer more warranties for short positions.

$$Ratio: Long/Short = \frac{LongProfits}{ShortProfits}$$

Ratio: Positive/Negative: Shows the relationship between the average profits (positives) by trade and the average losses (negative profits) by trade. The values of this ratio oscillate around 1. 1 is the equilibrium point between earnings and losses. While it value increases related to the equilibrium point, then the profit of the system. On the other hand, while this value increases bellow 1, then the system losses increase.

$$Ratio: Positive/Negative = \frac{\overline{PositivesEarnings}}{\overline{NegativesEarnings}}$$

Adjusted Gross Profit:

$$AdjGrossProfit = \left(PositiveTrades - \sqrt{PositiveTrades}\right) * \overline{PositiveEarnings}$$

The equivalent expression for the losses :

$$AdjGrossLoss = \left(Negative\ Trades - \sqrt{Negative\ Trades}\right) * \overline{NegativeEarnings}$$

These values provide an adjusted measure of the profits and the losses, in a way to be able to study them by using smaller amounts.

AdjustedNet Profit: AdjustedNet Profit:

$$AdjTotalNet = AdjGrossProfit - AdjGrossLoss$$

Ratio: AdjustedNet Profit /MinimalProfitWinners:

Shows the quotient of the adjusted net profit and the minimum net profit of the positive trades (winners)**.**

$$Ratio = \frac{AdjTotalNet}{WinnersMinimumNetProfit}$$

Ratio: AccumulatedNetProfit/MinimumNetProfit: Shows the quotient of the accumulated net profit and the MinimumNetProfit.

$$Ratio = \frac{AccumulatedNetProfit}{NetProfit\ (Minimum)}$$

Ratio: AdjustedNetProfit/ Minimum Drawdown: Shows the quotient of the adjusted net profit and the earnings of the trade with worse potential loss (minimum drawdown).

$$Ratio = \frac{AdjTotalNet}{Drawdown\ (Minimum)}$$

Ratio: Accumulated Net Profit/Minimum Drawdown: Shows the quotient of the accumulated net profit and the earnings of the trade with worst potential loss (minimum drawdown).

$$Ratio = \frac{AccumulatedNetProfit}{Drawdown\ (Minimum)}$$

Ratio: System/Market: Shows the relationship between the system earnings and the market earnings over the same period of time.

This ration enables to evaluate, in an objective way, the quality of the earnings obtained by the system inside the environment where it has been made.

If the value of this ration is inferior to 1, then the system loses in relation with the market. And the higher the value is above 1 the higher is the benefit of the system related to the market in a proportion equal to the ratio value.

$$Ratio = \frac{NetProfit}{MarketEarning}$$

Profit Factor: Calculates the relation between the total earnings and the total losses.

$$Profit\ Factor = \frac{TotalPositiveEarnings}{TotalNegativeEarning * (-1)}$$

The system profits are considered to be acceptable when the profit factor is above 2, this means when the proportion between earning and losses is 2 to 1.

Adjusted Profit Factor (APF): Shows the quotient between the total of the adjusted gross profit and adjusted total losses, this coefficient is very similar to the earning factor on its significance, the main difference is that when adjusting the profits, the coefficient gives more weight to the losses than to the benefits. If this quotient is lower than 1, the system is a loser system.

$$PRR = \frac{AdjGrossProfit}{AdjGrossLoss}$$

Sharpe ratio: The Sharpe ratio is a measure of the yield excess by unity of risk of an investment. The quantity is defined as:

For GAA the yearly earning IR the interest type.

$$Sharpe = \frac{GAA - IR}{Volatility}$$

The Sharpe ratio is used to show how the system compensates the investor to make him assuming the risk of his investment.

When two investments are compared, the one with the higher SharpeRation provides a higher yield for the same amount of risk to be taken. The investor normally takes investments with a high Sharpe ratio.

Profit Factor (Select): Calculates the relationship between the accumulated net profit (Select) of the positive trades and the accumulated net profit (Select) of the negative trades. Is very similar as well to the net profit, but in this case the atypical values do not take part in its calculation.

$$ProfitFactor\ (Select) = \frac{Accumulated\ Net\ Profit(Select)Winners}{Accumulated\ Net\ Profit\ (Select)Losers}$$

Regression Coefficient: Shows the regression coefficient between a trade profit and the number of trades. The ideal case is a positive coefficient because it means that the earnings along the trades are increasing, if the number is negative the situation is opposite. In a case of a value very close to 0, profits are stable.

$$Regresion\ Coef. = \frac{\sum_{i=1}^{n}(i * G_i) - \sum_{i=1}^{n}(TotalProfit * i)}{\sum_{i=1}^{n} i^2 - (\sum_{i=1}^{n} i)^2},$$

For $i = number\ of\ trades$, $G_i = Profit\ in\ the\ trade\ i$ y $n = number\ of\ trade$.

The regression coefficient, must not be considered as a measure of the amount of the system´s benefits, but as a method to evaluate the winning projection of the system

Regression since maximum profit: Shows the difference between the maximum net profit and the net profit of the last trade.

$$Regression\ since\ máximum\ profit = Net\ profit\ (Maximum) - Net\ Profit$$

Improvement since minimum profit: Shows the difference between the last trade net profit and the minimum net profit.

$$Improvement\ since\ mínimum\ profit = NetProfit - Net\ Profit(Minimum)$$

Number of Contracts/Shares: Shows the number of contracts/shares for each trade.

Number of Contracts/Shares (Maximum): Shows the maximum number of contract/shares on the trades.

Percentage of time on market: Shows the amount of time spent on-market.

$$\%Market = \frac{Negotiated\ Time}{TotalTime} * 100$$

Rina index: The RINA index is a measure of the relation yield/risk which relates the obtained benefit with the market average potential profit.

The higher this value, the higher the system efficiency.

The formula is as follow:

$$Rina\ index = RINA = \frac{Select\ net\ (Accumulated)}{Drawdown\ (Average) * \%Market}$$

Volatility: Shows the net profit volatility. If the value is close to 0, it will suggest that the system is less variable, this means that it has a similar profit every month, and the higher this number, the higher the variability of the monthly earnings.

$$GMA_i = Monthly\ Profit$$

$$J_0 = 100$$

$$J_1 = J_0 + GMA_1$$

$$J_n = J_{n-1} + GMA_n$$

$$K_1 = \frac{J_1}{J_0}$$

$$K_n = \frac{J_n}{J_{n-1}}$$

$$K_n = \frac{J_n}{J_{n-1}}$$

$$L_i = Ln(K_i)$$

$$D = DesvTp(L_i)$$

$$Volatility = \frac{D * 12 * 100}{2}$$

Account size: Displays an estimation of the necessary budget to face up the worst drawdown. It is calculated as the sum of the worst series losses and the average loss.

$$Account\ Size = Worst\ ContinuityGroup + NetProfit(Average)Negative$$

◼ System Optimization

An investment system which uses variable parameters shall be optimized. This process enables to look for the best parameters in a way to obtain its highest yield. To start the optimization process you need to insert the system in the chart of the value you are willing to study. Then click on the main menu **Charts** icon and in the **System** submenu click the icon **Optimize system**:
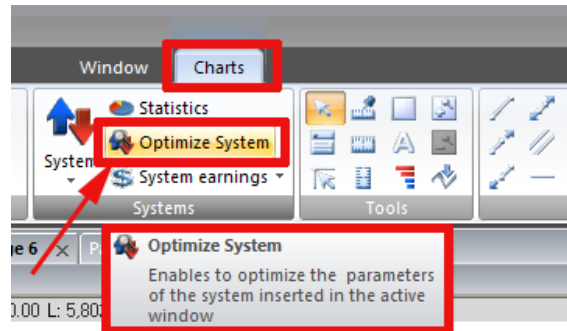
Fill the **System Configuration** form.

Elements of this form:

- **Name:** Signals the parameters which can be modified, as many as pointed out when programming the system.
- **Inferior:** Lower number of the parameter to be optimized.
- **Superior:** Higher number of the parameter to be optimized -+.
- **Increase:** Specifies the steps to be taking in to account. The normal number to use is 1, because the system will take all the possibilities one by one in to.
- But other increases can be applied depending on the type of parameters.

By clicking Ok the next window will pop up.
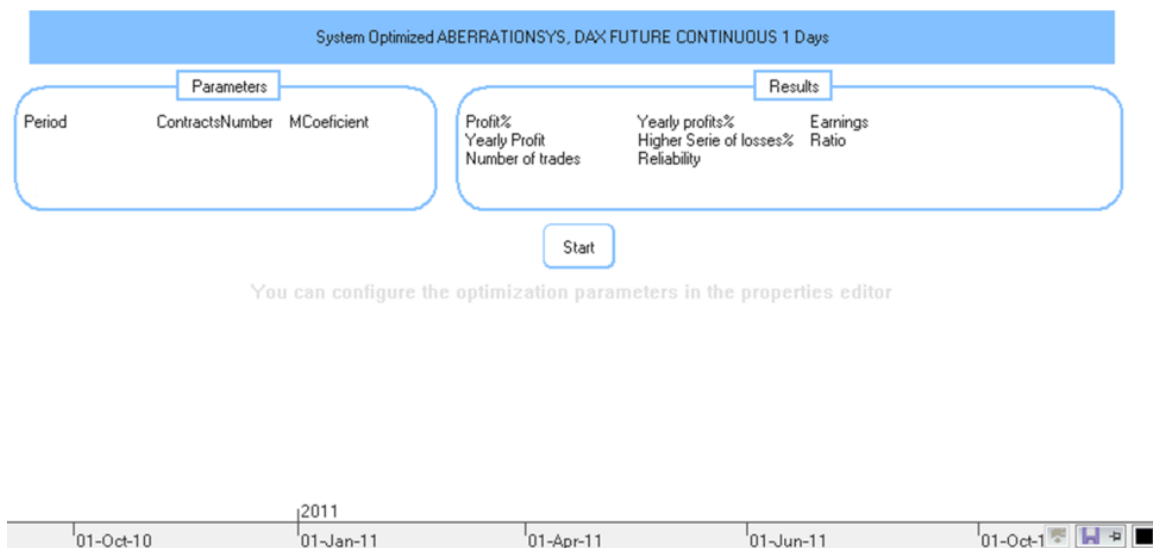
And the optimizer parameters shall be configured in the dialog selection box:
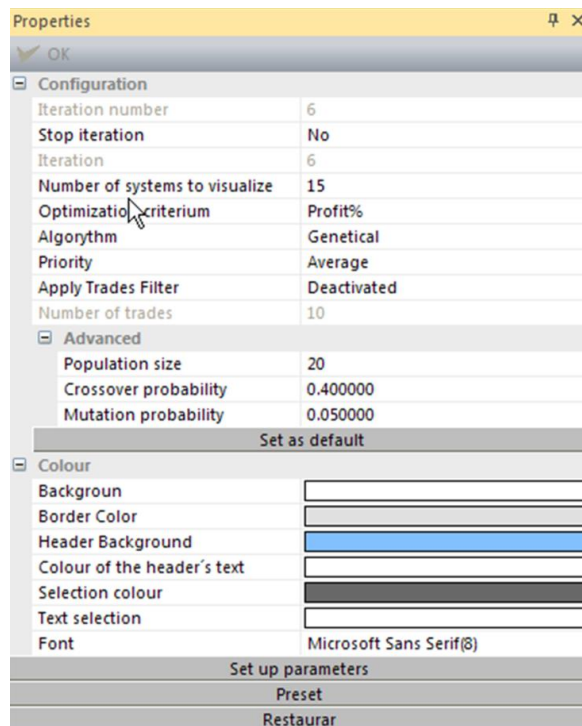
In this quote list you will be able to check:

- **Number of iterations:** These are the combinations which take place by comparing the parameters with the values located in the search periods and the required increment.
- **Stop in the iteration:** By marking this case, we can decide in the next case in which iteration we do want to stop the calculation if we do not want to arrive through the end of the calculation.

- **Number of systems to be visualized:** While the optimization process is taking place, we can have a look at the classification which is being generated in the calculation square and via this option we select the number of rows that we will to visualize. 15 by default.
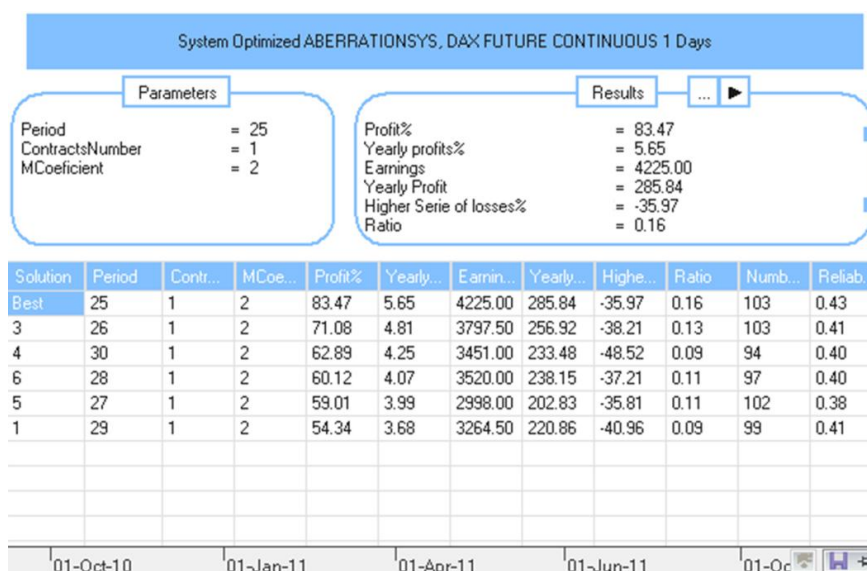- **Optimization Criteria:** Here, we will decide the criteria to put in order the different results being calculated. Here we will be able to chose between; percentage profit or profit in points, yearly percentage profit or points profit, maximum series of losses, ratio, number of trades and reliability.
- **Algorithms:** The optimization process can be carried out with any of the following methods:

  - **Linear Search**. Calculates the different possibilities by following an exact order, in a way that it starts with the First value of the First parameter and combines it with the rest of the values of the following parameters, then it will keep going with the second value and so on. These methods shall be used when the amount of iterations is not very high, and we have to take in to account, that, if we stop the process before its end, you may not have obtained the best existing combination of parameters because there is no slant on it calculation.

  -**Genetic Algorithms**. Calculates the different possibilities by following an efficient selection mechanism, which keeps fundamentally combining those values proving the best results. We normally use this method when the number of iterations is very high and we are trying to get the closer result to the optimal one, by a number of analyse steps which shall be not excessive in time and in customer. There is no need to wait until the end of the process, because the data obtained after a period of time are significant enough. The analysis starts by establishing what is called, population by generation, an amount which establishes random steps without slants on its favour.

  The advance configuration refers to the genetic algorithm where:

    - The **Population size** represents the number of possibilities the algorithm starts with. The higher this parameter, the more complete the process, and the higher the cpu resources required (so the time to optimize increases). The lower this parameter, the less complete the result, but the waiting time will be minimized.

- **Crossover probability and mutation probability.** When the crossover probability is very high and the mutation one is low, the process is faster, but the best of the obtained combinations may not be the optimal one because only the parameters located in a concrete range will be studied. When the crossover probability is lower and the mutation probability increases we manage to get higher diversity, till the point that a huge mutation probability will lead us to a random solution
- The values defined by default in the advanced configuration, involve an adequate proportion to the algorithm study, independently of the system we are using.

- **Priority:** If you are running several applications at the same time and, considering that the optimization process involves a huge cost to the processor, we have decided to offer the user the possibility of choosing the degree of priority he wants to concede to the optimization process to enable him to adapt his work to his currents needs. A low priority is advisable when the system is doing other duties external to the optimization. This way the operating system optimizes the process sharing between all the duties. However, the situation where the optimizer is the only task being executed, it is interesting to provide him with higher priority, to finish the work earlier on.
- Once the optimization parameters are completed click "start" to begin the process. At the end of the process you will see the following image:

System Optimized ABERRATIONSYS, DAX FUTURE CONTINUOUS 1 Days

Parameters

Period	=	25
ContractsNumber	=	1
MCoeficient	=	2

Results ... ▶

Profit%	=	83.47
Yearly profits%	=	5.65
Earnings	=	4225.00
Yearly Profit	=	285.84
Higher Serie of losses%	=	-35.97
Ratio	=	0.16

Solution	Period	Contr...	MCoe...	Profit%	Yearly...	Earnin...	Yearly...	Highe...	Ratio	Numb...	Reliab...
Best	25	1	2	83.47	5.65	4225.00	285.84	-35.97	0.16	103	0.43
3	26	1	2	71.08	4.81	3797.50	256.92	-38.21	0.13	103	0.41
4	30	1	2	62.89	4.25	3451.00	233.48	-48.52	0.09	94	0.40
6	28	1	2	60.12	4.07	3520.00	238.15	-37.21	0.11	97	0.40
5	27	1	2	59.01	3.99	2998.00	202.83	-35.81	0.11	102	0.38
1	29	1	2	54.34	3.68	3264.50	220.86	-40.96	0.09	99	0.41

01-Oct-10   01-Jan-11   01-Apr-11   01-Jun-11   01-Oc

Where "best" is the best solution founded.