

#QUANT #VOLATILITY - USER GUIDE - (with HFT cluster alert)

In this brand new paper we will first see a brief introduction of why and how I developed this new tool! What are its main functions, and its specificities!

We will then look and review the different features present in the tool, region by region.

We will then come back to the importance of reading the DV and DUDTV values, as well as the CDV and CDUDTV values! Then we will end with a broad description of all the different HFT alerts used for the creation of HFT clusters!

INTRODUCTION :

As you may have already noticed, this brand new tool called the [QUANT] Volatility has been developed and created around simple and clearly defined objectives:

- > to be more accessible in use with a minimalist tool for use
- > to be faster and easier to read in a scalping oriented manual trading environment
- > to be a tool in which we centralize the best HFT alerts
- > to be a possible working basis for the creation of a potentially automated trading strategy.

My goal here was generally twofold! Both to improve the relevance of the HFT alerts that generate trading signals, but also to simplify and make it easier to read the tool's various data.

From a technical and conceptual point of view, this new tool, the [QUANT] Volatility, will be based on :

- > the study of the execution of market orders, and their impact on price action.
- > the measurement of the type of execution used to serve market orders with CDV and CDUDTV then DV and DUDTV.
- > the measurement of price volatility with an average recalculated continuously over the last 20 periods.

---> the detection of execution anomalies and price manipulations with the triggering of various HFT alerts.

[QUANT] Volatility - description of the main features :

In region 1 :

---> **the price action** which will be visualized with green and red price bars to see the open/high/low/close for each price bar.

Inside these price bars you will find a white value that will be displayed on each price level! This value can be negative or positive. This is the DELTA VOLUME calculated per price level. By delta volume, I mean: "ASK Volume- BID Volume".

When this delta volume is positive, it means that there is more buyer volume traded on this price level than seller volume!

When this delta volume is negative, it will mean that there is more seller volume traded on this price level than buyer volume!

Each price bar that will be lower than the previous one will naturally be printed in red color!
Each price bar that has risen in relation to the previous bar will be printed in green color.



---> **The liquidity** which will be visualized with the thermal chart based on the information in the

order book; on each price level (below and above the last traded price), quantities will be colored in gray! These quantities will correspond to all the limit orders in the order book, available on each price level.

---> **The Bollinger Bands** that will give us a benchmark for price volatility measured against an average! The purple line will be considered as the fair value (the no mans land); and the green and red lines will be considered as sensitive areas, from which we can have a return of the prices inside the Bollinger Bands.

It will be interesting to look at the spacing of the bollinger bands! Indeed, when the bollinger bands are very tight, we will consider that the price volatility is in a contraction phase! On the contrary, when the bollinger bands are very wide apart, we will consider here that the price volatility is expanding!

We will also keep in mind that price volatility is generally very cyclical! That is to say that each phase of contraction will be followed by a phase of expansion, and vice versa! Each expansion phase will then be followed by contraction phases!



---> **The HFT alerts :**

- HFT Buy Div will be triggered when :

---> I have the price going down,
---> but that DV is positive,
---> and that DUDTV is also positive,
---> and that DUDTV is bigger than DV!

- HFT Sell Div will be triggered when :

---> I have the price going up,
---> but that DV is negative,
---> and that DUDTV is also negative,
---> and that DUDTV is smaller than DV.

- HFT buy convergence will be triggered when :

---> the price goes up
---> the DV is positive
---> the DUDTV is positive
---> DUDTV is bigger than DV
---> the price of the bar is below bollinger band

- HFT Sell convergence will be triggered when :

---> the price goes down
---> the DV is negative
---> the DUDTV is negative
---> the DUDTV is smaller than the DV

---> the price of the bar is above the bollinger

---> The additional HFT alerts :



- HFT Buy Manip will be triggered when :

---> the price action drops

---> the DV is negative

---> the DUDTV is positive

---> the price action is below the bollinger band.

- HFT Sell Manip will be triggered when :

---> the price action rises

---> the DV is positive

---> the DUDTV is negative

---> the price action is above the bollinger band.

- MM turn bullish will be triggered when :

---> the previous one (CDV-CDUDTV) must be positive

---> the current (CDV-CDUDTV) must be negative

- MM turn bearish will be triggered when :

---> the previous one (CDV-CDUDTV) must be negative

---> the current (CDV-CDUDTV) must be positive

- The Overbought alert will be triggered when :

---> the price goes up

---> the current RSI is above 75

- The Oversold alert will be triggered when :

---> the price drops

---> the current RSI is below 25

- The Gap Up with Manipulation alert will be triggered when :

---> the price goes from a lower price level to a higher price level, leaving a quote hole of at least 1 tick.

---> the delta volume of the bar is negative or equal to zero.

---> the price bar goes up

- The Gap Down with Manipulation alert will be triggered when :

---> the price goes from a higher price level to a lower price level, leaving a quote hole of at least 1 tick.

---> the delta volume of the bar is positive or equal to zero.

---> the price bar goes down.

---> Bubbles of volumes :

- each volume that exceeds a certain quantity threshold (set arbitrarily) will be displayed as a bubble.

- Buyer volumes will be displayed with green bubbles.

- Sell volumes will be displayed with red bubbles.

- large volumes will be displayed with larger bubbles than smaller volumes.

When you compare the size of these green and red bubbles with the size of the price bars in which they are triggered, you can have a very good visualization of the absorption phenomenon!

Indeed, the bigger a bubble will be, with a small price bar, the more the degree of absorption will be considered as high!

---> The creation of the main HFT clusters :

Still in this same region 1, and in a logic to get the best of my famous and numerous HFT alerts, I started to study what could be the best combinations of HFT alerts (the best HFT clusters).

Among the most interesting ones I found, we will find these different new HFT clusters following : (description + calculation formula) :

(cluster 1)

MM turn bullish + HFT manip =AND(ID29.SG1[-1] > 0 , ID29.SG1 < 0 , L < L[-1] , ID2.SG1 < 0 , ID2.SG50 > 0 , ID2.SG50 > ID2.SG1 , ID16.SG2 > H)

MM turn bearish + HFT manip =AND(ID29.SG1[-1] < 0 , ID29.SG1 > 0 , H > H[-1] , ID2.SG1 > 0 , ID2.SG50 < 0 , ID2.SG50 < ID2.SG1 , ID16.SG2 < L)

(cluster 2)

MM turn bullish + HFT div =AND(ID29.SG1[-1] > 0 , ID29.SG1 < 0 , C < C[-1] , ID2.SG1 > 0 , ID2.SG50 > 0 , ID2.SG50 > ID2.SG1 , ID16.SG2 > H)

MM Turn bearish + HFT div =AND(ID29.SG1[-1] < 0 , ID29.SG1 > 0 , C > C[-1] , ID2.SG1 < 0 , ID2.SG50 < 0 , ID2.SG50 < ID2.SG1 , ID16.SG2 < L)

(cluster 3)

MM turn bullish + HFT conv =AND(ID29.SG1[-1] > 0 , ID29.SG1 < 0 , L > L[-1] , ID2.SG1 > 0 , ID2.SG50 > 0 , ID2.SG50 > ID2.SG1 , ID16.SG2 > H)

MM turn bearish + HFT conv =AND(ID29.SG1[-1] < 0 , ID29.SG1 > 0 , H < H[-1] , ID2.SG1 < 0 , ID2.SG50 < 0 , ID2.SG50 < ID2.SG1 , ID16.SG2 < L)

(cluster 4)

HFT manip + oversold =AND(L < L[-1] , ID2.SG1 < 0 , ID2.SG50 > 0 , ID2.SG50 > ID2.SG1 , ID16.SG2 > H , ID42.SG1 < 25 , H < H[-1] , L < L[-1])

HFT manip + overbought =AND(H > H[-1] , ID2.SG1 > 0 , ID2.SG50 < 0 , ID2.SG50 < ID2.SG1 , ID16.SG2 < L , ID42.SG1 > 75 , H > H[-1] , L > L[-1])

(cluster 5)

HFT Div + overbought =AND(C > C[-1] , ID2.SG1 < 0 , ID2.SG50 < 0 , ID2.SG50 < ID2.SG1 , ID16.SG2 < L , ID42.SG1 > 75 , H > H[-1] , L > L[-1])

HFT Div + oversold =AND(C < C[-1] , ID2.SG1 > 0 , ID2.SG50 > 0 , ID2.SG50 > ID2.SG1 , ID16.SG2 > H , ID42.SG1 < 25 , H < H[-1] , L < L[-1])

(cluster 6)

SL hunt + oversold =AND(ID60.SG1 < TIME(0, 0, 1) , L < L[-1] , H < H[-1] , ID42.SG1 < 25 , H < H[-1] , L < L[-1])

SL hunt + overbought =AND(ID60.SG1 < TIME(0, 0, 1) , L > L[-1] , H > H[-1] , ID42.SG1 > 75 , H > H[-1] , L > L[-1])

(cluster 7)

MM turn bullish + oversold =AND(ID29.SG1[-1] > 0 , ID29.SG1 < 0 , ID42.SG1 < 25 , H < H[-1] , L < L[-1])

MM turn bearish + overbought =AND(ID42.SG1 > 75 , H > H[-1] , L > L[-1] , ID29.SG1[-1] < 0 , ID29.SG1 > 0)

(cluster 8)

SL hunt + HFT B manip =AND(ID60.SG1 < TIME(0, 0, 1) , L < L[-1] , H < H[-1] , L < L[-1] , ID2.SG1 < 0 , ID2.SG50 > 0 , ID2.SG50 > ID2.SG1 , ID16.SG2 > H)

SL hunt + HFT S manip =AND(ID60.SG1 < TIME(0, 0, 1) , L > L[-1] , H > H[-1] , H > H[-1] , ID2.SG1 > 0 , ID2.SG50 < 0 , ID2.SG50 < ID2.SG1 , ID16.SG2 < L)

(cluster 9)

SL hunt + HFT B div =AND(ID60.SG1 < TIME(0, 0, 1) , L < L[-1] , H < H[-1] , C < C[-1] , ID2.SG1 > 0 , ID2.SG50 > 0 , ID2.SG50 > ID2.SG1 , ID16.SG2 > H)

SL hunt + HFT S div =AND(ID60.SG1 < TIME(0, 0, 1) , L > L[-1] , H > H[-1] , C > C[-1] , ID2.SG1 < 0 , ID2.SG50 < 0 , ID2.SG50 < ID2.SG1 , ID16.SG2 < L)



You'll find some more examples of screenshots for each of the different HFT clusters as attachments!

In region 2 :

In this region 2 we will find a histogram that will allow us to measure the volatility of the price action, and this in relation to an average price volatility calculated over 20 periods!



Indeed, in this region 2, we will have two values to study each time!

The first value (in white) signified "flight" will be a measure of the current price volatility, which will be calculated simply by taking the current range of the existing price bar (high-low range).

The second value (in purple) signified "Vol Avg20" will be an average calculated from the price volatility. This average will be calculated and updated on each price bar, starting from the last 20 periods.

The goal here is quite simple: to be able to compare the current volatility, with the average volatility, in order to know if we are rather in a phase of contraction of the volatility (below average) or in a phase of expansion of the volatility (above average). We will therefore keep in mind that this price volatility is and will remain most of the time very cyclical! We can also see it quite clearly on the histogram, which will oscillate both upwards and downwards, with the purple line (the average price volatility).

We will use this histogram in a double way!

---> both to detect if we are in high volatility or low volatility; for example if we want to work a trade in a FADE logic, we will make sure that the volatility of the bar we want to work is higher than the current volatility.

---> But also to know if the prices are on a phase of acceleration (with increase of the existing volatility, and passing above the average volatility), or on a phase of slowdown (with decrease of the existing volatility, and passing below the average volatility).

In region 3 :

In this region 3 we will find the DV/DUDTV & CDV/CDUDTV histogram ! This is probably the most important histogram to understand of this tool ! If you understand it perfectly, it will give you indications of choice to anticipate what will happen in the short term at the price level!



In this histogram of region 3, we will have here 4 main data that will be displayed and updated in real time, and closed for each of the price bars!

Among these 4 key values, we will find the following values:

---> the DV (delta volume calculated per price bar)

---> the DUDTV (delta uptick volume downtick volume, calculated by price bar)

---> the CDV (the delta volume calculated since the opening of the session)

---> the CDUDTV (the cumulative delta uptick volume down tick volume calculated since the

opening of the session).

It is very important to understand and distinguish the difference between DV and DUDTV!

---> the DV will inform us about the nature of the volume that has been traded! Indeed, if the DV is negative, it will mean that the nature of the volume that has been traded will be mostly selling ! On the contrary, if the DV is positive, it will mean that the nature of the volume that has been traded will be mostly buyer !

The DV will therefore inform us about the degree of balance or imbalance in the volumes, by simply indicating whether we have rather buyers at the market, or rather sellers at the market!

---> The DUDTV will be different! Indeed, this is also a subtraction (a delta) except that this time, this delta will make the difference not between the buyer and seller volumes; but between the volumes (buyer or seller) that made the prices go up (which have upticked the prices) with the volumes (buyer or seller) that made the prices go down (which have downticked the prices).

Thus, with the DUDTV, this time we no longer take into account the nature of the volume, but we will take into account the nature of the execution (or the way in which the volumes were executed in relation to the last quotation price); that is to say, executed on the last quotation price, above or below.

---> The CDV will be the same as the DV, with the only difference that the CDV will be accumulated since the opening of the session! CDV will cumulate all the DV, bar after bar, and this since the beginning of the session !

---> The CDUDTV will be the same thing as the DUDTV, with the only difference that the CDUDTV will be accumulated since the opening of the session ! CDUDTV will therefore accumulate all the DUDTV, bar after bar, and this since the beginning of the session!

In region 4 :

We will be able to retrieve the DV and DUDTV values, calculated for each of the price bars of the

chart!

As a reminder we'll have :

$DV = \text{Ask Volume} - \text{Bid Volume} = \text{buy market orders} - \text{sell market orders}$

$DUDTV = \text{Uptick Volume} - \text{Downtick Volume} = \text{buy or sell market orders which has upticked the price higher} - \text{buy or sell market orders which has downticked the price lower.}$

To finalize this document, I propose you to look now at the different examples of HFT clusters which are triggered on [QUANT] Volatility! You will see that the occurrence of these HFT alert combinations is really interesting! Both in terms of price positioning, and timing in terms of time!