

Expert Advisor USER MANUAL

**This manual applies to Expert Advisors developed by
Better Trader Every Day, LLC. ©**

* User Manual for the entry strategy is in a separate pdf file with the strategy-specific parameters described.

DETAILED EXPLANATION OF INPUT TAB PARAMETERS

The following pages explain all parameters in the input tab. Don't be overwhelmed by the number of input parameters. The more you use the EA, the less intimidated they are.

Nomenclature:

CP=current price

OP=open price at entry

TP=take profit price

SL=Stop Loss price

SLatEntry=Stop Loss at the trade entry (opening)

ATR= Average true range (latest value)

RPP= Risk per pip (computed based on risk amount, SL and lot size)

MAxx = Moving Average of xx periods, e.g. MA20

ASK=ask price

BID=bid price

EA=Expert Advisor

bar=a Japanese candle (defined by low, high, open, and close prices).

****All explanations are for a BUY trade. SELL trades follow the same logic with proper changes.**

What is a convex combination?

In many strategies for trailing stop-losses and take-profits there is a mathematical calculation often used in this EA. It is called the "convex combination" which is like this:

$$Y = c \cdot x_1 + (1 - c) \cdot x_2$$

the value Y is computed from two other values (x_1 and x_2). The parameter "c" is the convex weight. This formula guarantees (for c in [0,1]) that Y is always between x_1 and x_2 . As the value of c approaches 1, Y will approach x_1 ; as c approaches 0, Y will approach x_2 . In the following pages the parameter c appears with different names, for instance, *SL_opConvex01*, *SL_trConvex01* and *TP_opConvex01*.

Note: Ranges and steps for parameters

In order to help the EA user, each parameter has a recommended value range, and some of them have a value that disables the feature. This is shown next to the variable description in the input tab. For instance, if a parameter shows **|0|[0,0.2,1]**. The value between vertical lines is the one that disable this feature, in this case zero |0|; the recommended range for this parameters is [0,1], and the middle value of 0.2 is the recommended step to be used if this parameter is selected for optimization.

The following pages explain each of the parameters in the Expert Advisor.

Add any comment for your reference

This is a string variable that the user defines. It is also displayed in the chart top-left corner.

TIME PARAMETERS

Time frame (bar period)

All time frames from MT5 are available. The recommended time frames for this EA are M15, M20, M30, H1. This variable can be included in the optimization process.

ServerStartTime_hr, Entries allowed from this server hour [0,23]

ServerStartTime_min, ----- Plus these minutes [0,59]

These two parameters define the server time when entry trades are allowed every day. For instance, if you want to start the trade at 18 hour and 30 minutes, the two parameters are 18 and 30, respectively.

TradeWindow_hr, Entries allowed these many hours each day [0,24]

TradeWindow_min, ----- Plus these minutes [0,59]

This is the time window in that the EA is allowed to have entry trades every day. For instance, if you want the maintain a window of 6 hours and 15 minutes, the two parameters are 6 and 15, respectively.

tradeOnMonday, Allow to open trades on Monday (server time)

tradeOnTuesday, Allow to open trades on Tuesday (server time)

tradeOnWednesday, Allow to open trades on Wednesday (server time)

tradeOnThursday, Allow to open trades on Thursday (server time)

tradeOnFriday, Allow to open trades on Friday (server time)

When any of the tradeOnDAY variables is TRUE, the EA is allowed to open trades on the corresponding DAY of the week. When FALSE, no trades are open on that day, however, a trade opened on a TRUE day, can still stay open in a FALSE day if the trade has not hit the stop loss or the take profit. User could optimize which days are better to trade if so desired.

CloseAtHr, Daily position close at (hour) |-1|[0,23]

CloseAtMin, Daily position close at (min) |-1|[0,59]

CloseAtHr and CloseAtMin are active when both are non negative. If activated, any open position will close at the server time CloseAtHr:CloseAtMin of the day when it was opened. For instance, to close any open position at 22:50, set CloseAtHr=22, and CloseAtMin=50. This feature allows to use the EA for stocks and futures when the user wants to be sure the position is closed before the market closes every day to avoid overnight swap and/or margin charges. If a position is left open at 5pm EST on a Friday, there might be swap charges for the weekend; Swap is usually not charged during weekends, but if you get charged swap during weekends, and you want to avoid such charges, you may automatically close any position on Friday as shown in the section “Weekend Handling Parameters” below.

N (MaxBarExposure: close position after N bars) |0|[2,...]

After a position is open, it will be closed after N bars, independently of it being in profit or loss. To deactivate this feature set this parameter to 0.

AllowWorkOnTicks

This is a boolean parameter. If it is *false*, the EA will run faster, but will ignore most of the ticks in history. The only reason to set this parameters to *false* is when you are doing optimization and you want to save time, otherwise, it is better to keep it as *true* to process every tick move of the price.

ENTRY STRATEGY PARAMETERS

This section is in another pdf file which is specific for the Entry Strategy of your Expert Advisor.
The Entry Strategy pdf file should be in the same zip file where you downloaded this file.

Once you learn how to set the Entry Strategy parameters, you may proceed with the rest of the input file explained below.

TP <OPEN> PARAMETERS

Note: In general, for TP or SL methods, each has a specific set of variables that are needed. For instance, in the TP method called “TPopMult”, there are two variables needed: TP_opMult and TP_opNbars. Any other variable in the list within this group is ignored when using TPopMult. The list of variables needed in each method is listed next to the method’s name when you pull down the menu.

In all TP methods, if TP_opNbars > 0, it compares the computed TP with the highest high of previous TP_opNbars bars, and uses the lowest between the highest high and the calculated TP as the final open TP. If TP_opNbars ≤ 0, no comparison is done. Keep in mind that the TP price is computed after the SL price has been set.

At Opening TP method

These are the four methods to set the open TP:

TPopMult: TP_opMult, TP_opNbars

This is the most popular method used by traders. It multiplies (OP-SL) by TP_opMult to get (TP-OP). If TP_opMult is zero, there is no TP for this trade and the position will be only closed by a trailing SL. It then compares the TP computed with the highest price in the previous TP_opNbars bars, and selects the lower of the two values. If TP_opNbars ≤ 0, no comparison is done.

TPopPct: TP_opPct, TP_opNbars

TP is computed by adding TP_opPct % of the current price to OP. If TP_opPct is zero, there is no TP for this trade and the position will be only closed by a trailing SL. It then compares the TP computed with the highest price in the previous TP_opNbars bars, and selects the lower of the two values. If TP_opNbars ≤ 0, no comparison is done.

TPopAtr: TP_opAtr, TP_opNbars

TP is computed by adding TP_opAtr*ATR to OP. If TP_opAtr is zero, there is no TP for this trade and the position will be closed only by a trailing SL. It then compares the TP computed with the highest price in the previous TP_opNbars bars, and selects the lower of the two values. If TP_opNbars ≤ 0, no comparison is done.

TPopFractal: TP_opAtr, TP_opNbars

If TP_opAtr > 0, then TP is computed by adding TP_opAtr*ATR to OP, but it is not lower than the most recent fractal High price. If TP_opAtr is zero, there is no TP for this trade and the position will be closed only by a trailing SL. It then compares the TP computed with the highest price in the previous TP_opNbars bars, and selects the lower of the two values. If TP_opNbars ≤ 0, no comparison is done.

TPopFractalMU: TP_opMult, TP_opNbars

If TP_opMult > 0, then TP is computed comparing the most recent fractal High price above $OP + 1 * (OP - SL)$ and the TP computed with TP_opMult. The selected TP will be the minimum between the two. If TP_opMult is zero, there is no TP for this trade and the position will be closed only by a trailing SL. Then it compares the TP computed with the highest price in the previous TP_opNbars bars, and selects the lower of the two values. If TP_opNbars ≤ 0, no

comparison is done. This strategy makes sure that a TP is not too far from the open price when a recent fractal (price swing) is closer to the open price.

TPopGap: TP_opConvex01, TP_opNbars

After finding the latest gap in price, it sets the TP to a convex combination between between the low and high of the down-gaped bar. If no gap is found, the TP is set to the high of the previous candle plus $\max(200 \text{ points}, 0.5 * \text{ATR})$. *TP_opConvex01* is the convex combination weight. If near 1, it sets the TP farther from OP. It then compares the TP computed with the highest price in the previous *TP_opNbars* bars, and selects the lower of the two values. If $\text{TP_opNbars} \leq 0$, no comparison is done.

SL <OPEN> PARAMETERS

At the Opening SL Method

There are several method to calculate the SL at the opening of the trade (SLatEntry). They are:

FixPips: SL_opFixPips

This is the most popular method used by traders. It sets SL at SL_opFixPips below from the OP.

ATR: SL_opATR

This is another popular method. It sets SL at SL_opATR*ATR below from OP.

PrevBar: SL_opPrevBar

It sets SL below the lowest bar low in the previous SL_opPrevBar bars.

ATR+FP+PB: SL_opATR, opFixPips, opPrevBar

It compares ATR , FixPips and PrevBar SL calculations and selects the closest to OP if SL_opAggr is true, otherwise selects the farthest away.

FP+PB: SL_opFixPips, SL_opPrevBar

It compares FixPips and PrevBar SL calculations and selects the closest to OP if SL_opAggr is true, otherwise selects the farthest away.

FixPip+ATR: SL_opFixPips, SL_opATR

It compares FixPip and ATR SL calculations and selects the closest to OP if SL_opAggr is true, otherwise selects the farthest away.

PB+ATR: SL_opPrevBar, SL_opATR

It compares PrevBar and ATR SL calculations and selects the closest to OP if SL_opAggr is true, otherwise selects the farthest away.

Pct+ATR: SL_opPricePct, SL_opATR

It compares SL computed with SL_opPricePct and SL_opATR, then selects the closest to OP if SL_opAggr is true, otherwise selects the farthest away.

MA20: SL_opConvex01

It sets SL between the MA20 and the low of the previous bar. SL_opConvex01 determines how close to MA20 the SL is set.

AtrMA20: SL_opATR

It sets SL at the lowest between the low of the previous bar and MA20 – SL_opATR*ATR.

MA20200: SL_opConvex01

It sets SL between the MA20 and MA200. SL_opConvex01 determines how close to MA20 is set.

MA2040: SL_opConvex01

It sets SL between the MA20 and MA40. SL_opConvex01 determines how close to MA20 is set.

Pct: SL_opPricePct

It sets SL at SL_opPricePct % of ASK below from OP.

PctPB: SL_opPricePct, SL_opPrevBar

It compares SL computed with SL_opPricePct and SL_opPrevBar and selects the closest to OP if SL_opAggr is true, otherwise selects the farthest away.

OneBar: no params

It sets SL just below the previous bar low. No parameters are needed.

Swing: SL_opFixPips

It sets SL SL_opFixPips pips/10 below the previous fractal bar low.

Gap: SL_opConvex01, SL_opFixPips

It finds the nearest non-filled gap and sets SL inside that gap. SL_opConvex01 near 1 will set the SL farther from the OP; SL_opConvex01 near 0, will set SL nearer to OP. If no gap is a near non-filled gap, SL is set below the low of previous candle by SL_opFixPips/10.

Input Parameters used in SL Open methods:

SL_opFixPips

A fix amount of pips from OP.

SL_opATR

A multiplier to ATR.

SL_opPrevBar

Number of bars in the past

SL_opConvex01

A value between 0 and 1.

SL_opPricePct

A percent of the symbol's price.

SL_opAggr

A boolean parameter used in methods that compute more than one SlatEntry. If SL_opAggr is True the SlatEntry is set closer to the OP.

SL <TRAILING> PARAMETERS

SL Trailing Method (at each new bar)

There are several methods to calculate the trailing SL once the position is open. These methods are executed at the beginning of every new bar (not at every tick), unless otherwise indicated in the description below. Once you select a SL-trailing method, you need to set up additional parameters which are listed next to the method's name. Most methods listed below use the parameter *SL_trTrigFac* which controls when the SlatEntry will start trailing: when the position is in profit and $(CP-OP)$ is greater than $SL_trTrgFac * (OP-SlatEntry)$, then a move of the stop loss is allowed, and the size of the move is controlled by other parameters.

Static: SL won't move (no params needed)

SL won't move until the position is closed by TP. Be aware that if $TP=0$, this Static method will only give losses since there is no TP.

FixPips: SL_trTrigFac, SL_trFixPips

When the position is in profit and $(CP-OP)$ is greater than $SL_trTrgFac * (OP-SlatEntry)$, SL is set such that it is never more than $SL_trFixPips$ away at the open of each new bar.

ATR: SL_trTrigFac, SL_trATR

When the position is in profit and $(CP-OP)$ is greater than $SL_trTrgFac * (OP-SlatEntry)$, SL is set at $SL_trATR * ATR$ below the last bar low.

PrevBar: SL_trTrigFac, SL_trPrevBar

When the position is in profit and $(CP-OP)$ is greater than $SL_trTrgFac * (OP-SlatEntry)$, SL is set below the lowest bar low of the previous $SL_trPrevBar$ bars.

FP+PB: SL_trFixPips, SL_trPrevBar

When the position is in profit and $(CP-SL)$ is greater than $2 * SL_trFixPips$, the new SL is computed by comparing SL from $CP-SL_trFixPips$ and SL at the low of $SL_trPrevBar$. It selects the closest SL to the current price.

StepPip: SL_trTrigFac, SL_trFixPips

When the position is in profit and $(CP-OP)$ is greater than $SL_trTrgFac * (OP-SlatEntry)$, $SlatEntry$ is moved up $SL_trFixPips$, then, each time the close price moves up by $SL_trFixPips$, SL is moved $SL_trFixPips$ again.

StepAtr: SL_trTrigFac, SL_trATR

When the position is in profit and $(CP-OP)$ is greater than $SL_trTrgFac * (OP-SlatEntry)$, $SlatEntry$ is moved up $SL_trATR * ATR$, then, each time the close price moves up by $SL_trATR * ATR$, SL is moved $SL_trATR * ATR$ again. Notice that the step $SL_trATR * ATR$ is not constant, but depends on the last bar ATR.

StepMoney: SL_trTrigFac, SL_trFixMoney

When the position is in profit by $2 * SL_trFixMoney$, $SlatEntry$ is moved up $2 * SL_trFixMoney$ distance (in pips), then, each time the close price moves up by $SL_trFixMoney$, SL is moved $SL_trFixMoney$ again.

StepPct: SL_trTrigFac, SL_trPricePct

When the position is in profit by at least $(1+SL_trTrigFac)*SL_trPricePct*OP/100$, SLatEntry is moved up $SL_trPricePct*(TP-OP)/100$, then, each time the close price moves up by $SL_trPricePct*OP/100$, SL is moved $SL_trPricePct*OP/100$ again.

StepOSL: SL_trTrigFac, SL_trConvex01

When the position is in profit, and the CP-OP is greater than $T*SL_trTrigFac*(OP-SLatEntry)$ the SL is moved up to be away from the CP an amount equal to $(1-T*SL_trConvex01)*(OP-SLatEntry)$. The quantity “T” is the number of rounded times $CP-OP \geq SL_trTrigFac*(OP-SLatEntry)$. This means that as the position keeps growing in profit, the trailing SL gets tighter. The larger the SL_trConvex01, the closer (more aggressive) the SL is to the CP.

DelCl: SL_trTrigFac, SL_trConvex01

When the position is in profit, and $(CP-OP)$ is greater than $SL_trTrigFac*(OP-SLatEntry)$, SL is moved up $SL_trConvex01*(\text{difference in close price of the last two bars})$

Acc: SL_trTrigFac, SL_trConvex01 (recommended method)

SL is moved when $(CP-OP)$ is larger than $SL_trTrigFac*(TP-OP)$. For the following bars, SL is then set using a polynomial with a degree controlled by SL_trConvex01. Higher values of SL_trConvex01 result in more aggressive moves of SL toward the current price.

MA20: SL_trTrigFac, SL_trConvex01

If in profit and $(CP-OP)$ is greater than $SL_trTrigFac*(TP-OP)$, SL is set in between MA20 and last bar low, never higher than the last bar low. SL_trConvex01 controls how close to MA20 SL is set: 1 will be the closest to MA20.

ATR+MA20: SL_trTrigFac, SL_trATR

If in profit and $(CP-OP)$ is greater than $SL_trTrigFac*(TP-OP)$, SL is the minimum between the last bar low and $MA20-SL_trATR*ATR$.

B.E.+MA20: SL_trTrigFac, SL_trATR

When the position is in profit and $(CP-OP)$ is greater than $SL_trTrigFac*(OP-SLatEntry)$, and if MA20 Breaks Even ($MA20 \geq OP$), SL is set below the MA20 at a $SL_trATR*ATR$ distance.

MA20200: SL_trTrigFac, SL_trConvex01

When the position is in profit by an amount larger than $SL_trTrigFac*(TP-OP)$, SL is set in between MA20 and MA200. SL_trConvex01 controls how close to MA20 the SL is set. SL is never higher than the latest bar low.

MA2040: SL_trTrigFac, SL_trConvex01

When the position is in profit by an amount larger than $SL_trTrigFac*(TP-OP)$, SL is set in between MA20 and MA40. SL_trConvex01 controls how close to MA20 the SL is set. SL is never higher than the latest bar low.

CC_PL&SL: SL_trTrigFac, SL_trConvex01

If the position is in profit, and $(CP-OP)$ is greater than $SL_trTrigFac1*(TP-OP)$, and the last bar is in the right direction, SL is set as a convex combination of the latest bar low and the previous SL. $SL_trConvex01$ controls how close the SL is to the latest bar low price.

BarCount: SL_trBarCountOp, SL_trFixPips

When the position is in profit, and the number of bars after opening the position reaches $SL_trBarCountOp$, the SL is set to $SL_trFixPips$ from the close price.

PullBack: SL_trTrigFac, SL_trConvex01

When the position is in profit, and the latest local max price (fractal) that closes between the open bar and the current bar is overtaken by the latest bar close price, SL is set between MA20 and the low of the latest bar. $SL_trConvex01$ controls how close SL is to the MA20.

O.V.20: SL_trConvex01

When the position is in profit and the previous bar has a body greater than $(1+SL_trConvex01)*ATR$, SL is set to near the previous bar open, otherwise, SL is set to MA20. In other words, it mostly trails “O”n the “V”alue of MA20, but if there is a large body bar, the SL is moved near the open of that body, and stays there until the MA20 catches up, or another large body bar appears.

Swing: SL_trTrigFac, SL_trFixPips

When the position is in profit and $(CP-OP)$ is greater than $SL_trTrgFac*(OP-SLatEntry)$, and if there is a low fractal at the third previous bar, the SL is set to below the low of the third bar by a distance of $SL_trFixPips$ pips, otherwise, SL stays where it is.

HL20: SL_trConvex01, SL_trPrevBar

When the position is in profit, SL is set as a convex combination of the low price and MA20 $SL_trPrevBar$ bars earlier. $SL_trConvex01$ is in the interval $[0,1]$ and controls how close to MA20 the SL is set.

HA: SL_trTrigFac, SL_trPrevBar

When the position is in profit and $(CP-OP)$ is greater than $SL_trTrgFac*(OP-SLatEntry)$, it uses Heikin Ashi bars to compute the trailing SL from $SL_trPrevBar$ bars earlier, current price, previous SL, body size, ATR, etc.

Gap: SL_trConvex01

When the position is in profit, that a gap just happened, the SL is set as a convex combination of the previous bar low and the previous SL. $SL_trConvex01$ controls how close to the previous bar low the SL is set.

Nx9: SL_trBarCountOp, SL_Convex01

When the position is in profit and there are $SL_trBarCountOp$ consecutive bars closing down (red bars), and they also close below the 9-period exponential moving average (MA9). If such conditions are satisfied, SL is moved to a convex combination of the previous low and MA9. $SL_Convex01$ controls how close to the previous bar low SL is set. A low value of $SL_$

trBarCountOp set tight SL. This strategy was implemented with the idea of catching reversals quickly. For instance, if *SL_trBarCountOp*=2, and *SL_Convex01*=1, the SL will be set at the previous bar low once there are two consecutive down bars closing below the MA9. If *SL_Convex01*=0, this strategy set SL at the MA20.

Pct+ATR: SL_trPricePct, SL_trATR

When the position is in profit by at least half of the risk (*OP-SlatEntry*) is gained, *SlatEntry* is moved to $CP*(1-SL_trPricePct/100)$ or $CP*(1-SL_trATR*ATR)$, whichever is closer to the current price *CP*.

CutLoss: SL_trBarCountOp, SL_trConvex01

When the position is losing money at the close of the latest bar, *SL_trConvex01* (which is in this range: [0,1]) is mapped linearly to $p=[0.01, 0.1]*(OP-SL)$. If $Profit \leq -p$ and the number of bars since the open is greater or equal to *SL_trBarCountOp*, then SL is moved to $Close[latestCandle] - p/10$. This SL trailing strategy can be used to cut losses quick since the SL is set very tight to the close price of the previous bar. The smaller the two parameters are, the quicker the losses will be cut. Choose *SL_trConvex01* based on your risk tolerance for losses relative to the total risk in the trade (i.e., *OP-SlatEntry*). When using this strategy, the win rate will go down and the number of consecutive losing trades will go up, but it is still possible to have a profitable strategy with a profit factor greater than 1. This is the only SL trailing strategy that gets activated when the position is losing money.

Input Parameters for SL Trailing Methods

Only a maximum of two parameters are in play based on the SL-trailing method chosen above.

SL_trConvex01 [0,0.1,1]

Parameter used in several SL trailing methods. It should be in the interval [0,1]

SL_trTrigFac [0.2,0.2,1]

Parameter used in several SL trailing methods.

SL_trFixPips [10,10,120]

Parameter used in several SL trailing methods. Its unit is PIP.

SL_trATR [0.5,0.5,]

Parameter used in several SL trailing methods. Its unit is a fraction of ATR.

SL_trPrevBar [3,3,10]

Parameter used in several SL trailing methods. Its unit is number of bars.

SL_trPricePct [0.1,0.1,1]

Parameter used in several SL trailing methods. Its unit is % of price.

SL_trFixMoney [Currency amount]

Parameter used in several SL trailing methods. Its unit is in the account currency (e.g., USD, EUR, JPY, GBP, etc.).

SL_trBarCountOp [2,1,7]

Parameter used in several SL trailing methods. Its unit is number of bars. It is compared to the number of bars used in the trailing strategy.

SL PARAMS TO AVOID BIG LOSSES

The techniques below are performed before calling the SL trailing method chosen above at the beginning of each bar. These parameters only take effect if the position is currently nonprofitable (i.e., $CP < OP$). If a bar that is being formed touches the SL, these techniques will not take effect because they are only performed at the beginning of each bar. If these techniques are activated, they are designed to avoid big losses before being stopped out by the SL at the open. If you are too aggressive with these parameters you risk to be stopped-out very often.

SL_negGap: move SL when a negative Gap happens

In a BUY trade, Gap is defined as a three bar event where there is a distance (price gap) between the first bar HIGH and the third bar LOW.

In a SELL trade, Gap is defined as a three bar event where there is a distance (price gap) between the first bar LOW and the third bar HIGH.

If SL_negGap is true, move SL aggressively only if there was a gap in the opposite (negative) direction of the trade. Following bar's SL will be also tight.

If SL_negGap is false, do nothing on negative gaps events.

SL_X200 (reduce SL if cross MA200 & -trend)

If TRUE, and a bar with large body crosses MA200 in reversing trend, SL will be set very close to the last bar low price. Subsequent bar's SL will also be very close to the latest bar low price.

SL_x9nT: # bars crossing MA9 ≤ 2 [3,1,5]

If the last two bars are not in profit, and there are SL_x9nT bars closing down below the Moving Average(9), then the SL will be set very close to the last bar low price. Subsequent bar's SL will also be very close to the latest bar low price. The smaller SL_x9nT is, the faster the tight SL will be set.

SL_aBL: fraction of risk to close [0][0,0.2,0.8]

If SL_aBL is greater than zero, and $(CP-OP)$ is greater than $SL_aBL * (OP-SL)$ due to a large bar in the wrong direction, then it will set a SL very close to the last bar low price. Subsequent bar's SL will also be very close to the latest bar low price. The smaller SL_aBL is, the faster the tight SL will be set.

SL_BADbigBar ATR factor [0][2:1:5]

If there is one bar (or two consecutive bars) with big body size ($body > SL_BADbigBar * ATR$) against the position, the SL is set very tight, and continues to be tight from then on.

SL_ConsOppBars [1][1,2,11](reduce SL if conseq bars opp dir)

This is the number of consecutive opposite direction bars (opposite to the direction of the trade) that will trigger a tighter SL if the trade is in negative profit. If set to 1, it is not an active method.

SL PARAMS TO PRESERVE GAINS

The following parameters are used to quickly preserve the gains of a trade. These techniques are performed at the beginning of each bar, and when the position is in profit (i.e. $CP > OP$). If a bar that is being formed touches the TP, these techniques will not take effect because they are only performed at the beginning of each bar. If you are too aggressive with these parameters, your wins will tend to be small, not reaching full TP potential.

SL_posGap: move SL when a positive Gap happens

In a BUY trade, Gap is defined as a three bar event where there is a distance (price gap) between the first bar HIGH and the third bar LOW.

In a SELL trade, Gap is defined as a three bar event where there is a distance (price gap) between the first bar LOW and the third bar HIGH.

If SL_posGap is true, move SL aggressively only if there was a gap in the same (positive) direction of the trade. Following bar's SL will be also tight.

If SL_posGap is false, do nothing on positive gaps events.

SL_GOODBigBar ATR factor |0|[2:1:5]

If there is one bar (or two consecutive bars) with big body size ($body > SL_GOODbigBar * ATR$) in favor of the position, the SL is set very tight, and continues to be tight from then on.

SL_turbo01: fraction of TP-OP tight SL |0|[0:.2:1]

If the profit is greater than $(1 - SL_turbo01) * (TP - OP)$, the SL is moved near the previous bar low, and continues doing so at every new bar. In other words, the higher this parameter, the quicker the SL will start moving. Once it starts moving, it continues to keep a tight SL every new bar. This is a good strategy for situations when the profit keeps improving slowly without any big detectable jump in price. When this parameter is 0 it is inactive. When TP is set to zero, this parameter is also inactive.

SL_fractal: fractal near TP |<0.5|[0.4,0.1,1]

If the profit is greater than zero, and there was a fractal structure near the TP, i.e., $fractal_High \geq SL_fractal * (TP - OP)$, the SL is moved near the previous bar low, and continues doing so at every new bar. When SL_fractal is less than 0.5, or greater than 1, or TP is set to zero, this is inactive.

ASYMMETRICAL VOLATILITY PARAMETERS

DownVolatilityFactor, Down volatility factor |<=1|[1,1,5]

It helps to differentiate volatility when the traded instrument is UP versus when the traded instrument is DOWN. As we know the traded instruments usually drop faster --with more volatility-- than when they are going to higher prices. If DownVolatilityFactor is 1, both trend, up or down, are treated in the same way. If DownVolatilityFactor is greater than 1, it will consider that the volatility to the down side is greater by the DownVolatilityFactor value. This parameter is used in the SL strategies "to avoid big losses" and also in the strategies "to preserve gains." If neither of these two strategies are used in the input .set file, DownVolatilityFactor has no effect.

PARTIAL TAKE-PROFIT PARAMS <@each tick>

SL_Gain2BE: trigger to move to B.E. |0|[0,0.25,TP]

SL_Gain2CL: added trigger to close %vol |0|[0,0.25,TP]

SL_GainVol: volume fraction to reopen |0|[0,0.2,1]

SL_GainTight: use tight SL after partial close [true/false]

These three parameters work together to offer the feature of “partially taking profit” when a position is in profit. It works in Netting accounts without violating rules (new trades are netted (added for new long positions, or subtracted for new short positions). The following table explains all possible combinations of these three parameters.

SL_Gain2BE	SL_Gain2CL	SL_GainVol	Operations
0	0	≥ 0	Do nothing (the partial take-profit feature is disabled)
> 0	0	0	Only move SL to B.E. if Prof/Risk $>$ (SL_Gain2BE+SL_Gain2CL) No position is closed.
0	> 0		
> 0	> 0		
0	> 0	> 0	Move SL to B.E. if Prof/Risk $>$ SL_Gain2BE, and when Prof/Risk $>$ (SL_Gain2BE+SL_Gain2CL), close the position and reopen new position of size SL_GainVol*Lots
> 0	0		
> 0	> 0		

Nomenclature in the table:

0 : zero value

≥ 0 : a value greater or equal than zero

> 0 : a value greater than zero

SL : stop loss price

B.E. break even price

Prof : current profit (every tick) divided by the Risk taken when the position was opened.

Risk : potential lost in currency value if the position hits the SlatEntry

Lots : volume of the original trade

The TP price remains the same. The lower the value of SL_GainVol, the quicker profits are realized (locked in). If you want to use this partial profit feature properly, the following has to be satisfied: **(SL_Gain2BE + SL_Gain2CL) \geq SL_GainVol**. If this condition is not satisfied, and the second position with partial volume hits its SL, the sum of the two positions will generate a loss. Hence, in order to avoid losses with this feature, the EA checks if the **condition** is satisfied, if not, the SL_GainVol will be modified automatically to avoid a potential loss in the combined two trades. See example below.

If SL_GainTight is true, and a partial close has happened, then the second position SL will be set very tight (on the MA9) for the rest of the time. If SL_GainTight is false, then the SL for the second position will follow the SL-trailing strategy selected.

Examples:

1) If you want to move to break even once the price has moved into profit 50% of the risk (risk= OP-SlatEntry), and then you want reopen 20% of the original volume once the price moves up another 25% on top of the 50%, you need to set:

$$SL_Gain2BE=0.5, \quad SL_Gain2CL=0.25, \quad SL_GainVol=0.2$$

Once the position reaches $0.5 \times \text{risk}$ (risk= OP-SlatEntry), the SL is moved to break even. If the profit reaches $(0.5+0.25) \times \text{risk}$, then 100% of the position is closed, and another position is opened with 20% of the original volume at the market price. The TP is not moved, and the SL of the new position is the opening price of the position that was closed 100%.

2) If you want to move to break even once the price has moved into profit 120% of the risk (assuming the TP:SL is $> 1.2:1$), and then you want open 30% of the original volume at that moment, you need:

$$SL_Gain2BE=1.2, \quad SL_Gain2CL=0.0, \quad SL_GainVol=0.3$$

Once the position reaches $1.2 \times \text{risk}$ (risk= OP-SlatEntry), then 100% of the position is closed, and another position is opened with 30% of the original volume at the market price. The TP is not moved, and the SL of the new position is the opening price of the position that was closed 100%.

3) If you provide bad values for this feature, the EA will correct them as follows:

Suppose you prescribed: $SL_Gain2BE=0.3$, $SL_Gain2CL=0.1$, $SL_GainVol=0.8$ which do not satisfy the **condition above** ($(0.3+0.1)$ is not greater than 0.8). The EA will adjust $SL_GainVol$ to be below the sum of $(SL_Gain2BE + SL_Gain2CL)$ by 0.01 . In this example, $SL_GainVol$ will be adjusted to be 0.39 .

NOTE: the partially-taking-profit feature only happens once per trade.

NOTE: if the trailing SL has moved passed the open price of the first trade, the second trade SL will be equal or tighter than the latest SL of the first before it was closed. The following SL location will depend on $SL_GainTight$.

*****Note:** if *AllowWorkOnTicks* is *false*, PARTIAL TAKE-PROFIT PARAMS are ignored.

<TICK TRAILING> STOP LOSS PARAMETERS

In this new version of the EA we introduce a “tick trailing” method. Currently, only one parameter is needed.

SL_ttConvex01 |0| [0,0.1,1]

At every tick, the EA will check if the current price is in profit and far enough from the open price. If (CP-OP) greater or equal to $SL_ttConvex01 * (OP - SL_{atEntry})$, then the SL will be moved to either break even or just below the low price of the bar that triggered the event, whichever is better. In subsequent bars the SL will be set just below the low price of the previous bar as long as the bars keep going in the direction of the trade.

***Note: if *AllowWorkOnTicks* is *false*, tick trailing is ignore.

RISK MANAGEMENT (RM) PARAMETERS

Risk Management (RM) method at the open

There are 5 different ways to set the risk for a trade:

Fixed Risk % (RM:1,2,3,6)

This uses a fixed percent of the amount chosen in RM1 to calculate the amount of money risked in each trade. It will use InitialRisk_pct (RM2), MaximumRisk_pct (RM3) and MaxLotSize (RM6) when computing the lot size. The Risk% cannot be greater than the reduced risk when using RM7.5 (see below).

Risk based on WinRate (RM:1,2,3,6)

This uses a formula to compute the risk percent based on the past 3-month winning rate of the strategy. As soon as there are more than 3 trades in the current symbol, the running 3-month win rate is computed and the risk% is given by:

$$\text{Risk\%} = 0.5 + 0.05 * (\text{winRate\%} - 30)$$

The computed risk will be bracketed between 0.10% and RM3=MaximumRisk_pct; For the first 3 trades, the risk is given by RM2=Initial % Risk (per trade). The Risk% is multiplied by the amount chosen in RM1. The Risk% cannot be greater than the reduced risk when using RM7.5 (see below).

Fixed lot per order (RM:3,4,6)

This uses a fixed lot size of RM4=FixedLotSize for each trade. It will consider RM3=MaximumRisk_pct and RM6=MaxLotSize when computing the final lot size for the trade.

Fixed Lot/(10k FreeMarg) (RM:1,3,5,6)

This uses a fixed lot size of RM5=LotSizePer10k for each 10,000 units of the amount chosen in RM1. It will consider RM3=MaximumRisk_pct and RM6=MaxLotSize when computing the final lot size for the trade.

Fixed Currency Amount (RM:3,6,7)

This uses a fixed amount of account currency from the free margin defined by RM7=inpFixedMargin, and RM6=MaxLotSize when computing the final lot size for the trade. For instance, if your account is in USD, you could set it RM7=30 to risk 30 USD at every trade. It will consider RM3=MaximumRisk_pct.

RM0: Init.Deposit to calculate max loss allowed

This is the initial deposit in the account. This is used to compute the maximum daily and account loss allowed. During live trading, this quantity will differ from the account balance and equity.

*****IMPORTANT:** When the EA is loaded to the chart, it checks that this Init.Deposit is greater than the minimum balance, or equity, allowed which is determined by parameters RM10 and RM11 below. If this check fails, the EA is removed automatically from the chart.

The parameters RM1,..., RM7 used in the risk management methods above are variables that could be optimized, but we recommend to keep them constant. They are:

RM1: base amount in currency to apply Risk %

There are three options for RM1:

Initial Deposit (RM0)

Free Margin

*Allowed Daily Loss (RM8 * RM0)*

RM2: Initial % Risk (per trade)

RM3: Max % Risk (per trade)

RM4: Fixed Lot Size (per trade)

RM5: Lot Size Per every 10k of RM1

RM6: Max Lot Size per trade |0|>0]

RM7: Fixed Currency amount risked (per trade)

RM7.5: Risk reduction per loss |0|[0.25,0.25,0.5]

RM7.5 will reduce the risk for the next trade if either of the following two conditions is true:

Condition 1) the account equity is less than 98% of the initial deposit. The risk reduction multiplier is computed as $(1-v)^n$, where v is the value entered in RM7.5, and n is the rounded percent difference between the initial deposit and the equity. If the account equity goes above 98% of the initial deposit, this risk reduction is not applied.

Condition 2) the previous trade was a losing trade. The risk will be again reduced, this time by $(1-v)^m$, where m is the number of consecutive losing trades, until a trade is profitable, at which point the risk is reset to its original value.

Both conditions could be true if the account equity is below 98% and consecutive losses are happening. These two reductions are a way to control the total risk during bad trading times. If you don't like this risk reduction feature, simply set the value RM7.5 = 0.

OTHER RISK PARAMETERS (FIXED)

The following parameters of this section cannot be optimized.

RM8: MaxDailyLoss in % of Ini.Dep.

This is used to calculate the max daily loss allowed, as a percentage of the initial deposit. This does not change when the balance or the equity changes. Every new day (based on server time) the lowest equity allowed changes as per the prop firm rules (when they are enforced). See Note2 and Note3 below.

RM9: Safety factor for DailyLoss (RM8) [0.5,1]

This multiplies RM8 to have a buffer of safety. For instance, if RM8=5%, RM9=0.9, and Initial Deposit=10,000, then max daily loss limit is $0.05 \times 0.9 \times 10,000 = 450$, every new day. See Note2 and Note3 below.

RM10: MaxAccountLoss in % of Ini.Dep.

This is used to calculate the max account loss allowed, as a percentage of the initial deposit. This does not change when the balance or the equity changes. See Note2 and Note3 below.

RM11: Safety factor for Acct.Loss (RM10) [0.5,1]

This multiplies RM10 to have a buffer of safety for the account. For instance, if RM10=10%, RM11=0.9, and Initial Deposit=10,000, then max account loss limit is $0.10 \times 0.9 \times 10,000 = 900$. This means that the account equity cannot go below $10000 - 900 = 9100$ any time, any day. See Note2 and Note3 below.

RM12: Use RM8, RM10 when computing lot size

This is a boolean parameter (True/False). When TRUE, the lot size is checked against RM8 and RM10. When FALSE, the lot size calculation ignores RM8 and RM10 limits. However, margin limits are always checked.

RM13: Safety factor for MARGIN_SO_CALL [1,5]

Lot sizes are always checked against the MARGIN_SO_CALL level value for your account. As a safety, we check against $RM13 \times MARGIN_SO_CALL$ to diminish the chances of a margin call. RM13 must be larger than 1. If a proposed trade violates the safe margin level, lot size is reduced automatically.

RM14: Nbr Simult. symbols in trading (Tester only)

It is likely that you will use this EA in multiple symbols simultaneously in a single MT5 terminal. Since this EA only runs on one symbol at a time, the Tester –during optimization-- can only compute the free margin due the symbol being simulated. In order to simulate the presence of more symbols being active in the live trading, the EA assumes –during the Tester simulation-- that there are RM14 symbols running simultaneously, each one with the same amount of margin required. A reasonable value could be RM14 between 2 and 4, but the user is free to set it outside this range. If RM14=1, then the simulation assumes 100% of the account balance is available for margin.

RM15: % Ini.Dep. target (closeALL, stop EA) [0|>0]

When trading to pass a prop firm challenge, there is always a target to achieve. This target is computed as $RM15 \times RM0 / 100$ (RM0 is the initial deposit entered in the input set file). If you are using a prop firm and RM15>0 and the equity has achieved the target, all orders and positions will be closed (no matter

what MAGIC number they have) and the EA will stop trading. This is done to avoid momentarily passing the challenge, then reversing. This feature only applies in live trading.

RM16: *Req.Margin must be less than Balance/2 (boolean)*

If RM16 is true, the lot size calculation makes sure that the required margin is less than half of the account balance; If RM16 is false, this check is not performed. In either case, the required margin level is always checked in the calculation of the lot size. If RM16 is true, the Lot size is automatically adjusted to comply with this constraint.

*****Note1:** Keep in mind that the margin required in Forex is computed as

$$\text{Margin} = \text{Lots} * \text{Contract_Size} / \text{Leverage} * \text{Margin_Rate}$$

therefore, using large lots (i.e., large RM1 with large RM6), will require to reserve large margins for the trade, leaving less balance available for other trades in parallel.

*****Note2:** If there are several symbols using this EA simultaneously, the max loss allowed (daily or account) must be the same in all symbols. That is: RM8*RM9 and RM10*RM11 must be the same in all symbols. If they are different from symbol to symbol, then the EA behavior is likely to be incorrect.

*****Note3:** if *AllowWorkOnTicks* is false, max daily loss and max account loss are ignored tick by tick.

PROP FIRM INFORMATION

Our EA is “proprietary firm” friendly. If you are using our EA to pass a Proprietary firm challenge, you will like these features. You need to provide three parameters:

Prop.Firm-like rules for daily & account DD

These rules are used when computing the daily and account draw-down limits. Each prop firm has its own rules regarding the daily draw-down. The current version of the EA supports the following “types” of rules:

FTMO-like rules (go to www.ftmo.com)

TheFundedTrader-like rules (go to www.thefundedtraderprogram.com)

NoRules

*****IMPORTANT:** You don’t need to use FTMO or TFT; you are simply stating that your prop firm uses rules “like” FTMO, or “like” TFT.

***** Note:** if you select “NoRules” the counter of violation of max daily losses will increase every tick that the daily loss is violated. This does not affect anything in the strategy, but you will see a large number in the Tester Summary printed in the Journal tab, and if you choose to constraint the number of max daily losses, it is likely this constraint will be violated.

***** Note:** if you select “NoRules” the daily loss limit and account loss limit are still checked at every tick using RM8,RM9,RM10, and RM11, but what will happen is that the EA won’t stop trading if the daily or account loss limits are violated.

*****Note:** if *AllowWorkOnTicks* is false, *PropFirm* rules are also ignore tick by tick.

Current GMT off set (eg, Prague=2 when DST, 1 otherwise)

This is the current GMT off set for the prop firm location. For instance, FTMO is in the Central European Time zone, which is GMT+1 when there is no Daylight Saving Time (DST) (~October to ~March), or it is GMT+2 when there is DST. So, depending on when in the year you are running this EA, you would enter 1, or 2 if you are using FTMO. In another example, TheFundedTrader is in the Easter Standard Time zone, which is GMT-5 when there is no DST, or GMT-4 when there is DST. So, you would enter -5 or -4 depending on when you are using this EA.

Roll over hour in PropFirm time (e.g., 17 for TheFundedTrader)

This is the time when the prop firm reset the day to start a new trading day. In the case of FTMO, they do it at CET 24 (that is at midnight), hence you enter 24 here. The prop firm TFT does it at EST 17 (that is at the 5pm), hence you enter 17 here. Your prop firm may have different roll over hour that you will find in the prop firm website, and enter here.

***** IMPORTANT:** make sure you change the parameter *Current GMT off* twice a year (first in the Spring, and second in the Fall)

MISCELLANEOUS PARAMETERS

Order Type

There are three order types you can select from:

Market
Stop
Limit

We recommend Market or Stop orders. Each order type uses different parameters shown in parenthesis:

Market (instant execution, no params)

Stop (NBACK, WBSO)

Limit (WBLO,nBackLO,atrLO)

Note: there are some Entry Strategies that enforce Stop orders internally.

NBACK: # bars back high/low for Stop Orders

When using stop orders the EA set the BUY price just above the high of this # of previous bars. A value of 1 is common.

WBSO: Max # waiting bars for Stop Orders

The EA will wait up to this many bars to trigger the stop order; after that, the order is canceled.

WBLO: Max # waiting bars for Limit Orders

The EA will wait up to this many bars to trigger the limit order; after that, the order is canceled.

nBackLO: for Limit Orders

atrLO: for Limit Orders

In order to set the limit price, the EA will use lows of nBackLO bars in the past and also Ask-atrLO*ATR of current bar.

Max # Open Symbols |0|[1:1:n] (Live trading)

The user can run this EA with as many symbols as desired simultaneously, but because of the margin requirements, there may be cases in which the lot size becomes too small when too many symbols are open (depending on your risk in each trade). One way to avoid very small lot sizes, is to limit the number of symbols that can open positions simultaneously. That number is given in this parameter. If this parameter is 0, there is no limits of how many symbols can be trading simultaneously.

Slippage (points) for closing positions [2,20]

This is the slippage allowed when closing trades.

Waiting time (minutes) before week starts

The user may want to start trading some minutes after the opening of the week (5pm EST). This parameter define the number of minutes to wait before trades are allowed. If the time frame is larger than this waiting time, a full time frame bar goes without trades.

Allow trades to BUY, or SELL, or Both

The user can force the EA to send only BUY orders, or only SELL orders, or Both kinds of orders. We recommend to allow Both kinds of orders.

Display Permitted daily losses on chart

When TRUE, the permitted daily loss is displayed in the chart, and updated on every tick. This takes cpu time, and is not recommended to be used for all open charts in the MT5 terminal.

Magic number. If 0, autogenerate MAGIC number

The user can prescribe a MAGIC number here. If this is set to zero, a unique MAGIC number is generated by the EA for each symbol in the MT5 terminal. We recommend to set this to 0. The auto-generated MAGIC number will be unique and depends on the symbol, time frame, strategy, and other values.

NEWS HANDLING PARAMETERS (Live trading only)

The purpose of this section is that users can prevent (if so desired) opening trades during a window around an important news event (as some prop firms require). These parameters can also manage any position already open when the news window begins. For instance, the user may want to move SL before the news starts in case there is a big move in price caused by the important news; or the user may want to close open positions as well.

Minutes before News to take actions

Set the number of minutes before the news when the EA should start taking news action. This is the beginning of the news window. News actions are considered at every tick.

Minutes after News to restart trading

Set the number of minutes after the news when the EA should end taking news action. This is the end of the news window. News actions are considered at every tick.

Action for profitable open positions

If there is an open position in profit when the news window is beginning, the user have five options to handle the position:

Close it

Keep open, same SL

Keep open, move SL to Break Even

Keep open, move SL to $NAF \times ATR$

Keep open, move SL halfway

NAF is an abbreviation for News Action Factor.

Action for losing open positions

As in the case above, the user has the same five option when the position is losing at the beginning of the news window. The last three options may result in very tight SL.

Close it

Keep open, same SL

Keep open, move SL to Break Even

Keep open, move SL to $NAF \times ATR$

Keep open, move SL halfway

NAF: News Atr Factor to tight SL

NAF is used if the user prefer the last option to move SL to $NAF \times ATR$ away from the current price. The smaller NAF is, the tighter the SL, and the more likely that a small movement in the price will stop-out the position. The last option, namely, “move SL halfway” will move the current SL to the middle between the current SL and the current price.

Reset SL back to original (after news)

When TRUE, and when SL has been moved based on the options above, the SL is reset after the news window is done. The SL is moved back to the same value as before the news window began. When FALSE, SL is not moved back to its original value.

Close pending Orders before News

When TRUE any order pending is close before entering the news window. There are prop firm that allow orders during the news, in which case FALSE is the proper value.

Note 1: the News calendar is read using the built-in function `MqlCalendarEvent` from Metatrader 5. These are the same news you can see in the “Calendar” tab. No other news feed is used.

Note 2: Only “high” importance news are considered, but the following news are also considered as high importance regardless of what the calendar says: CPI, PPI, and Employment for the USD symbols; and CPI, PPI for GBP symbols.

Note 3: If you request to close a profitable position during the news window, this action will only happen if the position is profitable inside the news window. For instance, the position might have been a losing trade when the news windows starts (in which case the news action is determined by your choice of losing positions), then the position turns profitable inside the news window which will trigger the news action to close the position if so requested.

Note 4: Keep in mind that important news (or events during a weekend) may create gaps in the price which might jump over the Stop Loss price. In other words, there is no guarantee that a stop loss price would trigger a closing-position order.

WEEKEND HANDLING PARAMETERS

Handling weekends is done with the same philosophy of handling news. The user may want to keep positions open, or close them, or move the SL before the weekend starts (5pm EST). Variables are used in the same way as in the news handling section above. There is no option to restore the SL to its original value after the weekend.

Minutes before Friday 5pm EST to take actions

Weekend action for profitable open positions

Weekend action for losing open positions

Close pending Orders before weekend

*** Note: While optimizing input parameters, if you select to close winning positions on Friday 5 EST, you will see that Friday will become the most profitable day of the week.

Weekend action for profitable open positions

If there is an open position in profit when the weekend starts, the user have four options to handle the position.

Close it

Keep open, same SL

Keep open, move SL to Break Even

Keep open, move SL to $WAF * ATR$

Keep open, move SL halfway

WAF is an abbreviation for Weekend Action Factor.

Weekend Action for losing open positions

As in the case above, the user has the same four option when the position is losing at the beginning of the weekend. The last three options may result in very tight SL.

Close it

Keep open, same SL

Keep open, move SL to Break Even

Keep open, move SL to $WAF * ATR$

Keep open, move SL halfway

WAF: Weekend Atr Factor to tight SL

WAF is used if the user prefer the last option to move SL to $WAF * ATR$ away from the current price. The smaller WAF is, the tighter the SL, and the more likely that a small movement in the price will stop-out the position. The last option, namely, “move SL halfway” will move the current SL to the middle between the current SL and the current price.

Note 1: Keep in mind that important events during a weekend (e.g., a war between countries, the death of a president, etc.) may create gaps in the price which might jump over the Stop Loss price. In other words, there is no guarantee that a stop loss price would trigger a closing-position order.

WITHDRAWAL SIMULATIONS (for the Tester only)

MetaTrader5 allows to simulate withdrawals during a tester simulation. These are the variables to simulate them.

Wmoney [0|[0,Ini.Dep.]

This is the amount in account currency that will be withdrawn (simulated during the testing).

Wmult [≥ 1]

When the account balance is greater than the Initial balance + $Wmult * Wmoney$, a withdraw in the amount of $Wmoney$ will be executed in the tester simulation. For instance, if $Wmoney=500$, $Wmult=2$, Initial Deposit=10000, then there will be a withdrawal of 500 every time the account balance reaches $10000+2*500$ or 11000; after the withdraw, the balance goes to 10500.

CUSTOM MAX OPTIMIZATION

If the user wants to use this section of the inputs, we direct you to the article in

<https://www.mql5.com/en/articles/14365>

titled “A Generic Optimization Formulation (GOF) to Implement Custom Max with Constraints”
In that article you will learn how to use GOF.

The default set file --provided along with this User Manual pdf file-- has the optimization settings we use to optimize parameters every week or every two weeks. The user is also encourage to test with different ranges, steps, and parameters when running the optimization. You may change objectives (Custom Max Criterion), and hard constraints.

Optimization Problem

The following screenshots show a setup of the optimization problem using GOF. You are welcome to experiment once you get familiar with it.

Objective:

- Maximize the Annual Return %.

Hard constraints:

- Daily Loss as % of Initial Deposit must be less or equal to 5%
- Account Loss as a % of Initial Deposit must be less or equal to 10%
- Win rate % greater or equal to 55%
- Consecutive losing trades to be less or equal to 5
- Recovery factor to be more or equal to 2
- Number of Maximum Daily Loss events per year to be less or equal to 0.
- Number of trades per week to be greater or equal to 1
- Monthly VaR for 95% confidence to be less than 15%
- MCPredProf/MCPredStd to be greater than 2
- Return on Risk % (RoR) to be greater than 10%.

- Build Custom Objective to Maximize:		
<input checked="" type="checkbox"/> Select Objective Function to Maximize 1:	1] Annual Return %	
<input checked="" type="checkbox"/> Target 1	100	
<input checked="" type="checkbox"/> Weight 1	100	
<input checked="" type="checkbox"/> Select Objective Function to Maximize 2:	0] NO objective	
<input checked="" type="checkbox"/> Target 2	5	
<input checked="" type="checkbox"/> Weight 2	3	
<input checked="" type="checkbox"/> Select Objective Function to Maximize 3:	0] NO objective	
<input checked="" type="checkbox"/> Target 3	10	
<input checked="" type="checkbox"/> Weight 3	3	
<input checked="" type="checkbox"/> Select Objective Function to Maximize 4:	0] NO objective	
<input checked="" type="checkbox"/> Target 4	0	
<input checked="" type="checkbox"/> Weight 4	0	
<input checked="" type="checkbox"/> Select Objective Function to Maximize 5:	0] NO objective	
<input checked="" type="checkbox"/> Target 5	0	
<input checked="" type="checkbox"/> Weight 5	0	
- Hard Constraints:		
<input checked="" type="checkbox"/> if false, all constraints are ignored	true	
<input checked="" type="checkbox"/> Select Constraint Function 1:	1] Daily Loss % InitDep (RM...	
<input checked="" type="checkbox"/> Type 1	<= Less or equal to	
<input checked="" type="checkbox"/> Bound Value 1	5	
<input checked="" type="checkbox"/> Select Constraint Function 2:	2] Acctn Loss % InitDep (R...	
<input checked="" type="checkbox"/> Type 2	<= Less or equal to	
<input checked="" type="checkbox"/> Bound Value 2	10	
<input checked="" type="checkbox"/> Select Constraint Function 3:	5] Win Rate %	
<input checked="" type="checkbox"/> Type 3	>= Greater or equal to	
<input checked="" type="checkbox"/> Bound Value 3	55	
<input checked="" type="checkbox"/> Select Constraint Function 4:	4] # Consecutive losing tra...	
<input checked="" type="checkbox"/> Type 4	<= Less or equal to	
<input checked="" type="checkbox"/> Bound Value 4	5	
<input checked="" type="checkbox"/> Select Constraint Function 5:	7] Recov Factor	
<input checked="" type="checkbox"/> Type 5	>= Greater or equal to	
<input checked="" type="checkbox"/> Bound Value 5	2	
<input checked="" type="checkbox"/> Select Constraint Function 6:	15] # MaxDailyLoss Events/...	
<input checked="" type="checkbox"/> Type 6	<= Less or equal to	
<input checked="" type="checkbox"/> Bound Value 6	0	
<input checked="" type="checkbox"/> Select Constraint Function 7:	6] # trades/week	
<input checked="" type="checkbox"/> Type 7	>= Greater or equal to	
<input checked="" type="checkbox"/> Bound Value 7	1	
<input checked="" type="checkbox"/> Select Constraint Function 8:	20] Monthly VaR% for 95% ...	
<input checked="" type="checkbox"/> Type 8	<= Less or equal to	
<input checked="" type="checkbox"/> Bound Value 8	15	
<input checked="" type="checkbox"/> Select Constraint Function 9:	17] MCPredProf/MCPredStd	
<input checked="" type="checkbox"/> Type 9	>= Greater or equal to	
<input checked="" type="checkbox"/> Bound Value 9	2	
<input checked="" type="checkbox"/> Select Constraint Function 10:	16] RoR=(Net Profit C)/(Tot...	
<input checked="" type="checkbox"/> Type 10	>= Greater or equal to	
<input checked="" type="checkbox"/> Bound Value 10	10	

The Misc Optimization Parameters are:

----- Misc Optimization Params -----	
<input checked="" type="checkbox"/> Choose Result-column's decimals	WinRate %
<input checked="" type="checkbox"/> Choose capital method for Risk of Ruin	Loss Allowed by PropFirm
<input checked="" type="checkbox"/> Custom Value for Risk of Ruin (if needed)	0
<input checked="" type="checkbox"/> Annual Risk Free rate% for Sortino calc.	2
<input checked="" type="checkbox"/> Draw summary on chart	false
<input checked="" type="checkbox"/> Print summary on journal	true
<input checked="" type="checkbox"/> Subtract Largest Profit from Netprofit	true
<input checked="" type="checkbox"/> Add Largest Loss to Net profit	false
<input checked="" type="checkbox"/> Multiplier for Objectives (k_o)	100000
<input checked="" type="checkbox"/> Multiplier for Penalties (k_p)	100

OnTester Summary Explained

The summary printed in the Journal tab has many of the same variables in the Backtest tab, plus some more computed by the EA. Here we explain those additional variables that are not in the Backtest tab. For more information please read the GOF article mentioned above.

The top part of the Summary looks like this:

===== OnTester SUMMARY =====		
--- PARTy on XAUUSD - 2025.09.04 23:58:59 ---		
Initial Deposit : C100000	Test Length(Yrs) : 0.33	
MetaTrader Profit : C30317	Annual Return % : 120.8	
Profit (inc Exp.) : C26272	Annual Return % : 101.0	
minEqty-IniDep : C-644.0	minEqty-IniDep % : -0.6	
maxEqDDrel % : 7.0	maxEqDDrel : C8675	
maxBalDDrel % : 6.1	maxBalDDrel : C7512	
maxEqtyDD : C8675	maxBalDD : C7512	
minBal-IniDep : C-5.0	minBal-IniDep % : -0.0	
ExpPayOff/IniDep % : 0.34	maxEqtyDD/IniDep % : 8.68	
Recov Fact : 3.49	Profit Fact : 1.60	
Reward/Risk ratio : 1.16	Sharpe ratio : 3.16	
WinRate % : 58	Total Trades : 88	
AvgWinTrade : C1583.9	AvgLossTrade : C-1363.8	
Best Trade : C3611.5	Worst Trade : C-2214.4	
# Trades/week : 5.1	# ConscLossTrd : 5	
maxDalyLoss : C-4576	# maxDalyLoss/Yr : 0.0	
AvgRisk/trade : C2225	ReturnOnRisk % : 15.5	
Expectancy : 0.25	GoodPrediction % : 49	
Avg Vol : 0.60	LargestVol : 0.63	
Account Levrge : 200	Min Marg Levrge : 1000	
Total Commission : C-434	Commission/GrossProf % : -0.54	
Total Swap : C-1016	Swap/GrossProf % : -1.26	
Sortino ratio : 0.57	Risk of Ruin % : 0.00	
MC daily VaR95 % : -2.17	MC daily CVaR95 % : -2.84	
MC monthly VaR95 % : -9.94	MC monthly CVaR95 % : -13.01	
MC maxEqDDrel+2std : 17.99	MC # conscLossTrd+2std : 11	
MC Prof Mean / Std : C30284.8 / C4782.0	ratio : 6.33	

- Initial Deposit: initial deposit in the account (also shown as IniDep or Ini.Dep.)
- Test Length(Yrs): the length of the test measured in years
- MetaTrader Profit: profit as reported by MetaTrader
- Annual Return %: annual return in percent
- Profit (inc Expenses): Net profit minus commissions, swaps, and largest win (if requested).
- minEqty, minBal: minimum equity and balance in the test
- maxBalDDrel: maximum balance drawdown relative
- maxBalDD: maximum balance drawdown
- maxEqDDrel: maximum equity drawdown relative
- maxEqDD: maximum Equity drawdown
- Recov Fact: recovery factor
- Profit Fact: profit Factor
- Reward/Risk ratio: also known as RRR=average win / average loss.
- WinRate%: win rate in %
- AvgWinTrade, AvgLossTrade: average winning and losing trade in currency
- Best Trade, Worst Trade: best and worst trade in currency
- # Trades/week: number of trades per week
- # conscLossTrd: max number of consecutive losing trades
- maxDalyLoss: maximum loss in a day, in currency
- # maxDalyLoss/Year: number of times that the max daily loss was reached during the test, per year.
- AvgRisk/trade: average risk (in currency) per trade
- ReturnOnRisk %: $(\text{NetProfit} / \text{sum}(\text{Risk @ open})) * 100$. It is the net profit over the sum of opening risk of all trades.
- AvgVol LargestVol: average trade volume, largest trade volume
- Expectancy: defined as $\text{WinRate} * \text{RRR} - (1 - \text{WinRate})$.
- GoodPred%: percent of trades where the first bar closed in the profit direction
- Account Levrge: account leverage
- Min Marg Levrge: minimum margin level percent during the test
- Total commission: total commission in currency
- Commission/GrossProf %: total commission as percent of gross profit.
- Total Swap: total currency spent in Swap
- Swap/GrossProf %: swap as percent of the gross profit
- Sortino: the Sortino ratio
- Risk of Ruin %: risk of ruin the account (account=based on Misc Optimization Parameters)
- MC daily VaR95 %: 95% confidence Value at Risk% daily (Monte Carlo estimation)
- MC monthly VaR95 %: 95% confidence Value at Risk% monthly (Monte Carlo estimation)
- MC daily CVaR95 %: 95% confidence Conditional Value (shortfall) at Risk% daily (Monte Carlo estimation)
- MC monthly CVaR95 %: 95% confidence Conditional Value (shortfall) at Risk% monthly (Monte Carlo estimation)
- MC maxEqDDrel+2std is the Monte Carlo estimation of max equity relative draw down (mean plus $2 * \text{StdDev}$). This may happen with ~2% probability.
- MC # conscLossTrd+2std is the Monte Carlo estimation of number of consecutive losing trades (mean plus $2 * \text{StdDev}$). This may happen with ~2% probability.
- MC Prof Mean / Std: Monte Carlo predicted profit mean divided by its standard deviation. Ratio is the value of the division.

The second part of the summary looks like this:

```
| ---- Objective Functions ----  
|      Value      Target Weight Contribution%  
| MAX_AnnRetPct: 1.01e+02 100.00 1000.00 99.9%  
| MAX_Rew2RiskRatio: 1.16e+00 10.00 10.00 0.1%  
| ----- Constraints: (Actual vs Bound) -----  
| Pass   : MaxDailyLoss = -4.58% vs -5.00%  
| Pass   : MaxLossTrade = -2.21% vs -5.00%  
| Pass   : MaxAccLoss = -0.64% vs -25.00%  
| Pass   : WinRate = 58% vs 50%  
| Pass   : nbrConsecLossTrades = 5 vs 10  
| Pass   : RecovFactor = 3.49 vs 2.00  
| Pass   : Eqty_DrawDown = 6.97% vs 15.00%  
| Pass   : Trades/Week = 5.1 vs 0.5  
| Pass   : MCPredPrf(Mean/Std) = 6.33 vs 2.00  
| Pass   : monthlyVaR = -9.94% vs -15.00%  
| Pass   : ReturnOnRisk % = 15.48 vs 5.00  
| -----  
| Custom Max Obj Value: 1.001e+12  
| =====  
*** Sim elapsed time = 39.0 sec
```

In this second part the EA reports shown above the multiple objectives and constraints. Four values are printed for objectives:

- Value: objective function value
- Target: target value
- Weight: weight value
- Contribution: how much the objective contributed to the total objective value, in percent.

For each constraint the report prints Pass or FAIL, the actual value of the constraint, versus the bound it is subject to.

Lastly, the Custom Max Objective value is printed. Keep in mind that this value has no physical meaning as it is the result of penalties and scaling factors, however, it serves as the metric to maximize your objective.

GLOBAL VARIABLES

Metatrader 5 has a feature to store permanent global variables. They can be seen by pressing F3 key on the keyboard, or going to Tools → Global Variables. This EA uses global variables to preserve some values in case there is a crash (power off, OS freezes, MT5 freezes, etc). When you restart the MT5 terminal, the stored global variables are read and used as if there was no crash.

One global variable users should be aware of is called *accountNbr_ResumeTradingOnDay*, where *accountNumber* is, obviously, the account number. In MT5, days are numbered starting from 0=Sunday to 6=Saturday. The EA won't trade anything if the actual day of the week is less than the global variable *accountNbr_ResumeTradingOnDay*.

The default value of *accountNbr_ResumeTradingOnDay* is zero, but there are two situations in which they may not be zero:

1) The Max daily loss limit is very close; the EA will close all trades, and stop trading. There will be a *Sleep()* command that will make the EA wait until the next day when trades can resume. In this case *accountNbr_ResumeTradingOnDay* is not zero temporarily until the EA wakes up from the *Sleep()* command.

2) The Max account loss limit is very close; the EA will close all trades, stop trading, remove the EA from the chart.

Global variables can be changed manually (via F3 key), but user must be aware of what the consequences are of changing them.

Global Variables				
Variable		Value	Time	
1/2 5019462724_ResumeTradingOnDay		0.0	2025.03.07 11:59	Add Delete
1/2 GBPJPY_H2_5019492844_CurrTicket		-999.0	2025.03.07 12:33	
1/2 GBPJPY_H2_5019492844_g_slAtOpen		-999.0	2025.03.07 11:00	
1/2 USDJPY_H2_5019480834_CurrTicket		-999.0	2025.03.07 12:00	
1/2 USDJPY_H2_5019480834_g_slAtOpen		-999.0	2025.03.07 11:59	
1/2 USDJPY_H2_5019492964_CurrTicket		-999.0	2025.03.07 12:33	
1/2 XAUUSD_H3_5019496074_CurrTicket		-999.0	2025.03.07 12:33	
1/2 XAUUSD_H3_5019496074_g_slAtOpen		-999.0	2025.03.07 11:00	