



Electronic engineering for MOTORSPORT APPLICATIONS

Misura la tua passione... migliora le tue performance.

DANAS PRO

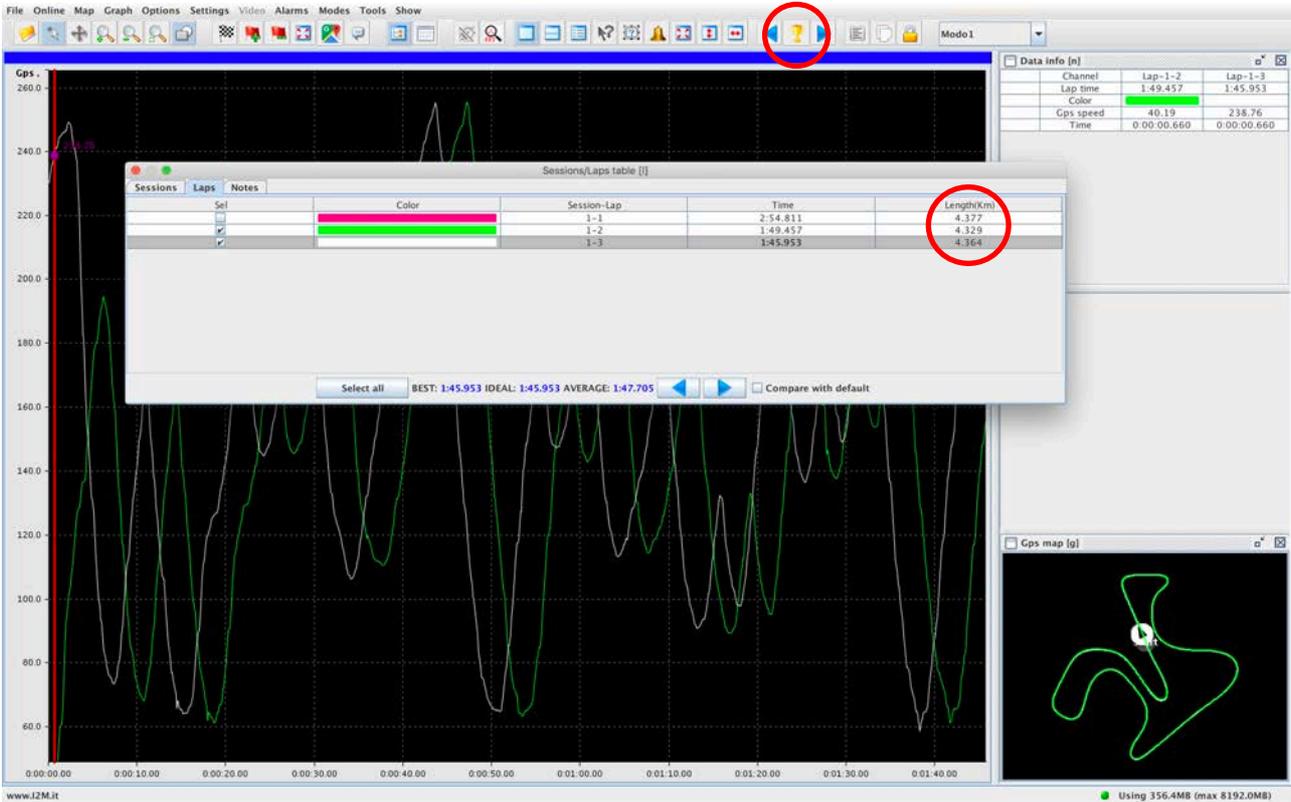
Tutorial

Laps comparison

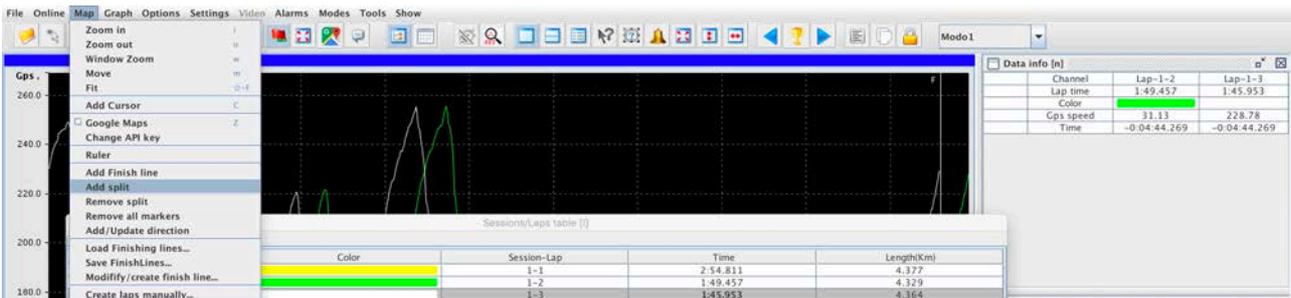


Version 1.0

In this tutorial we will focus on comparing multiple laps. As for the previous tutorials, let's assume that you have opened our demo session, that you are in lap mode, that you have selected the best lap (with the appropriate button highlighted in the figure) and lap number two and finally that you have set the speed display. GPS. We are therefore in the situation shown in the figure.



We have already seen how the comparison can be made both with the X axis in time mode and in space mode. By putting the axis in space mode, Danas Pro will calculate, for both laps, the distance traveled thanks to the gps speed signal, thus obtaining the two distances traveled. As we can see from the data highlighted in the previous figure, the distances are not exactly identical and this is normal because the trajectories, and therefore the space traveled, can change from lap to lap. Danas Pro assumes that (obviously) the length of the lap is always the same and expands or collapses the graphs to make them the same length. The only point on which Danas Pro can in fact make an absolute comparison is on crossing the finish line. However, we can improve this approximation simply by adding new intermediate milestones: new splits.

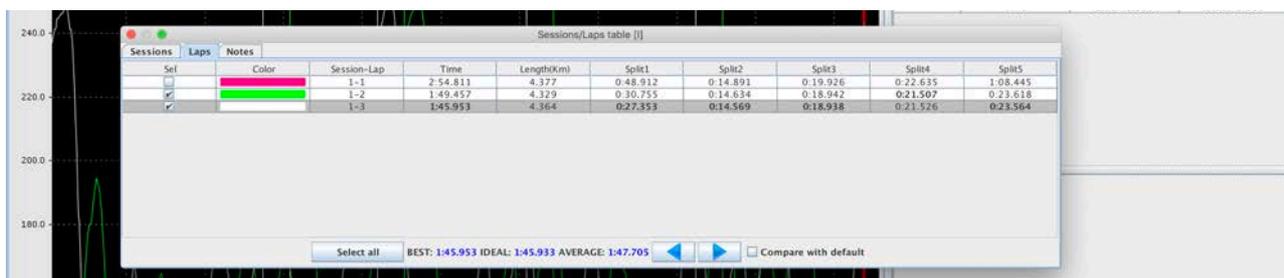


To do this, we can select the "add finish line" function via the map menu or by selecting the button with the red flag and the "+" symbol.

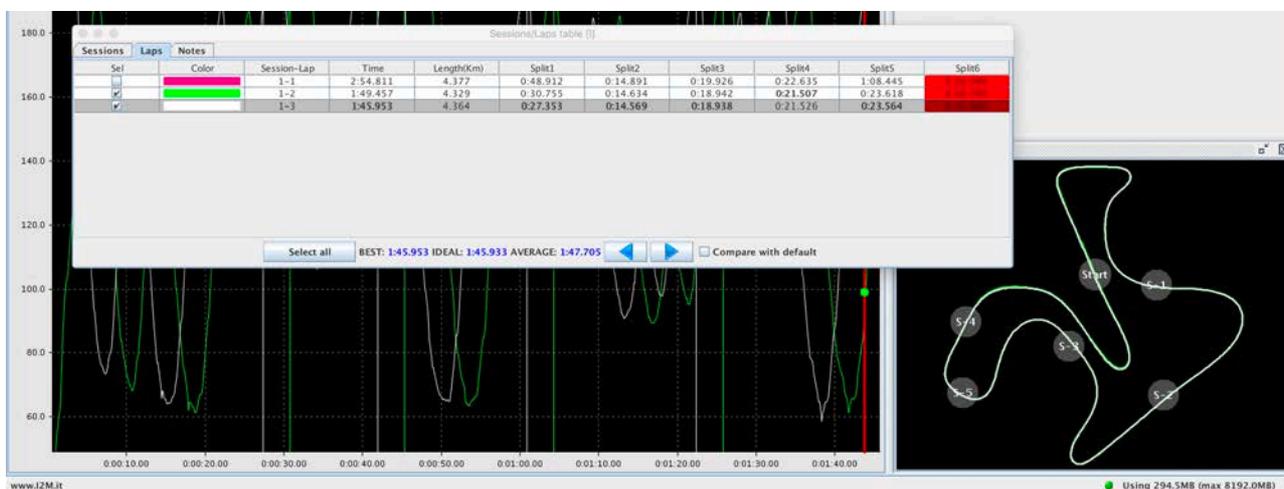
We can then proceed to add splits as we did with the finish line. ATTENTION: we must place the split times in crossing order, then split1, then 2 etc .. as shown in the figure. As in the case of the finish line, we can decide to add the direction as well.



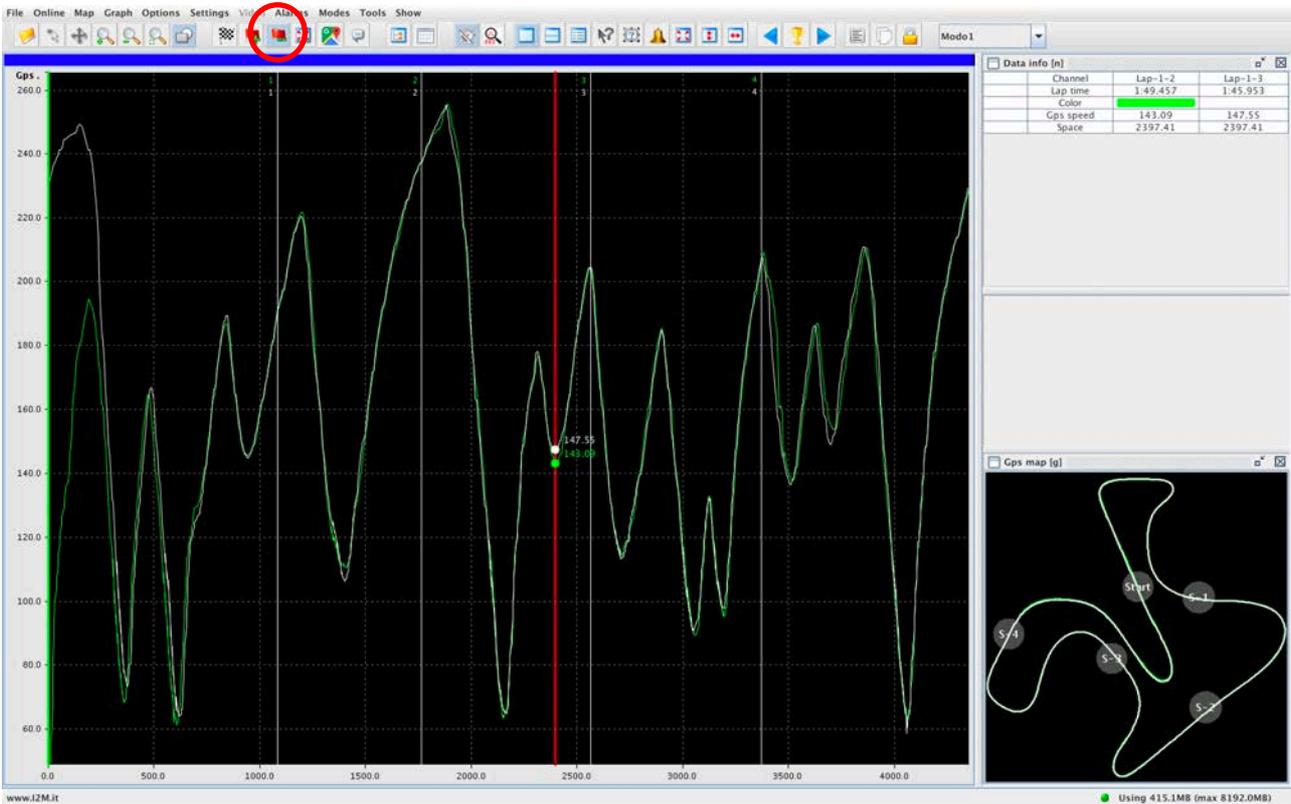
If we decide to save the current finish line, as we did in the previous tutorials, it will also contain the newly entered splits. What happens if we put a split in the wrong order, or if it doesn't cut all the trajectories (the size of the finish line also applies to splits)? To check it, open again the sessions / laps window. Now, as shown in the figure, the table will also show us the times of the individual splits.



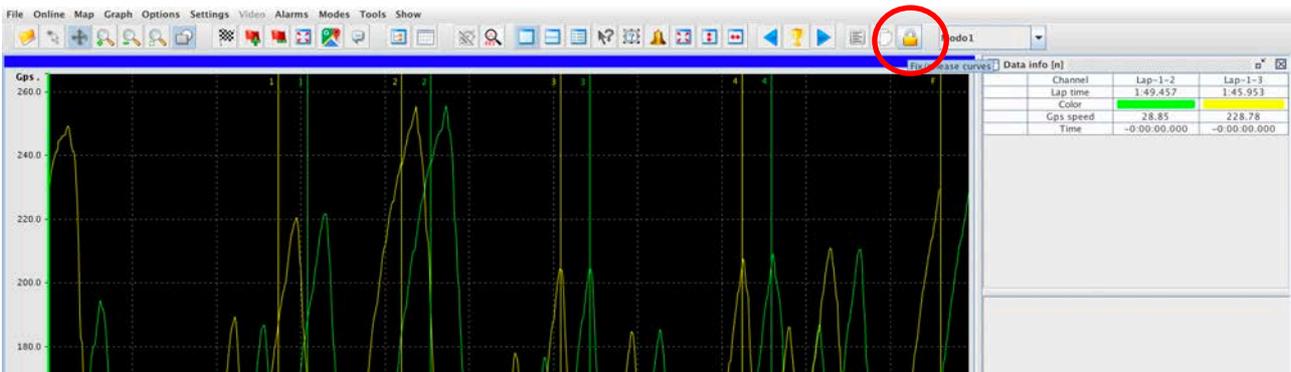
We will return later to the description of some notes relating to this table. Now let's try to place a split in the wrong position, for example before S4. So if we see the Danas Pro table it will tell us that there is a problem on each lap for that split time.



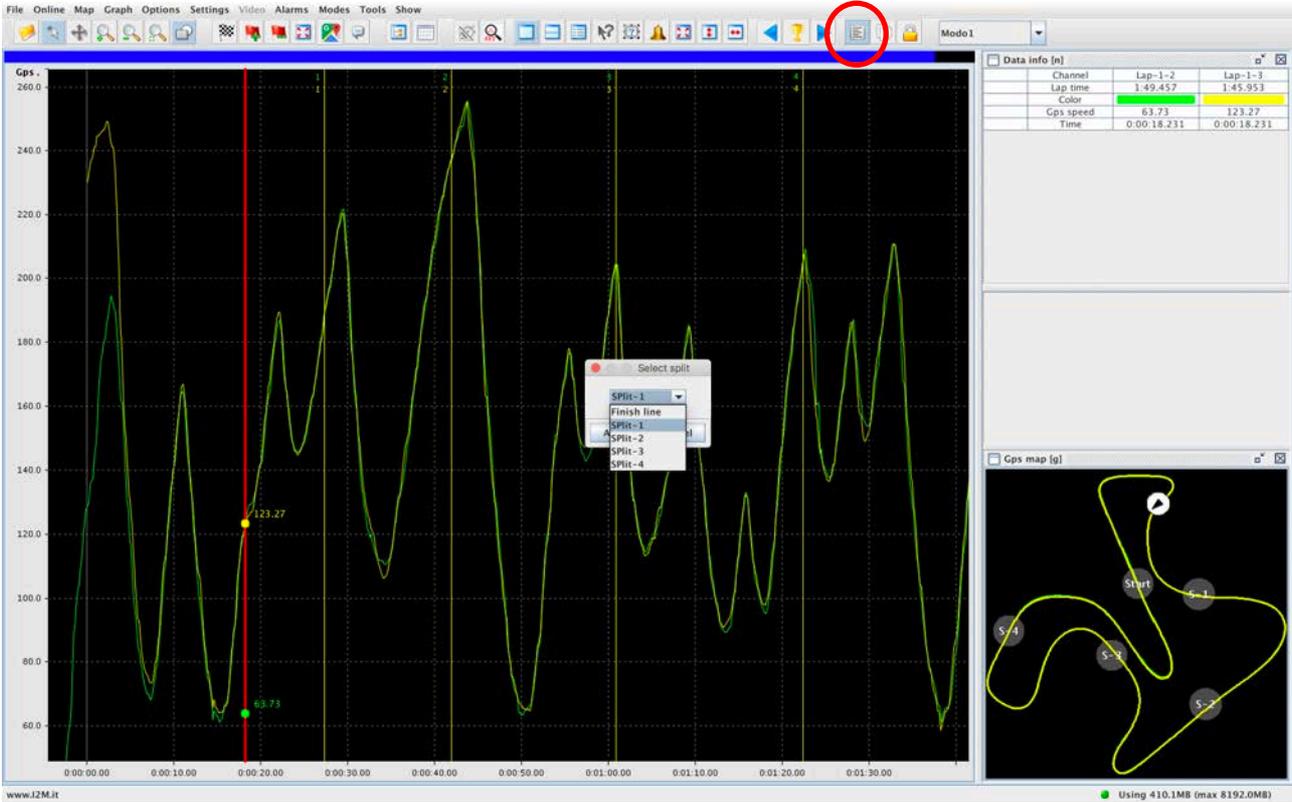
To solve it we must select the "remove split" function or use the button with the red flag and the "-" button. We will then just click on the split incorrectly positioned to delete it.



Here is the result of the comparison between the GPS speeds in space mode in which the lines of the various split times are visible. As we can now see obviously the split lines, being in space mode, are perfectly overlapped. Looking at the data we realize that the speeds are practically identical except for the first 6-700m (we can also see this by looking at the numerical value of the various splits in the table). We could therefore ask ourselves what would be the alignment in time mode between these two laps if we could "ignore" for example the first split. Danas Pro allows us to do exactly this, that is to realign the laps, not on the finish line but on any of the split times. To do this, first of all, let's go back to the "times" mode of the graph axis. We must then tell Danas Pro that we want to "unlock" the curves, that is, that they will no longer have to be linked to a single time axis for all the curves. To do this we must press the padlock button visible in the figure (or the lock / unlock curves function in the graph menu).



Now we just need to tell Danas Pro which split we want to line up on. To do this, press the button highlighted in the figure, a window will then appear for choosing the split. By selecting (and pressing apply) the split 1 we will obtain the result in the figure, in which, as we had imagined, the curves are also superimposed in time mode.



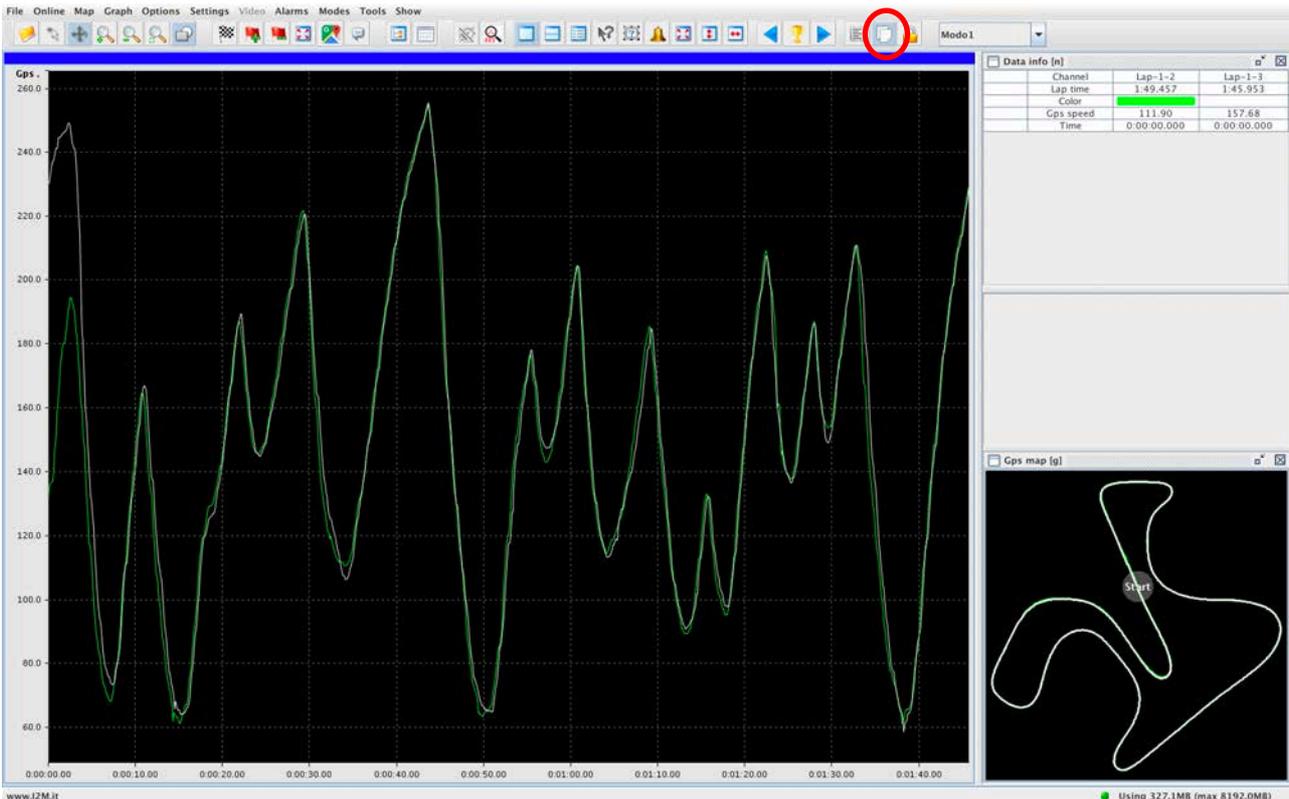
Do we have to use a split time to realign the curves? The answer is no. We use the remove split function to remove all splits.



We have therefore returned to the condition in the figure. If we look at the circled area of the graph, we can see that it is perfectly clear to us how much the phase shift is at that point, it would be enough for us to realign those two peaks, how can we do?

Once again we must check that we have unlocked (we can first lock to cancel all previous modifications) the appropriate padlock. Next to the padlock button we have a button with an icon consisting of two overlapping sheets and which allows you to align the curves using the left and right mouse button.

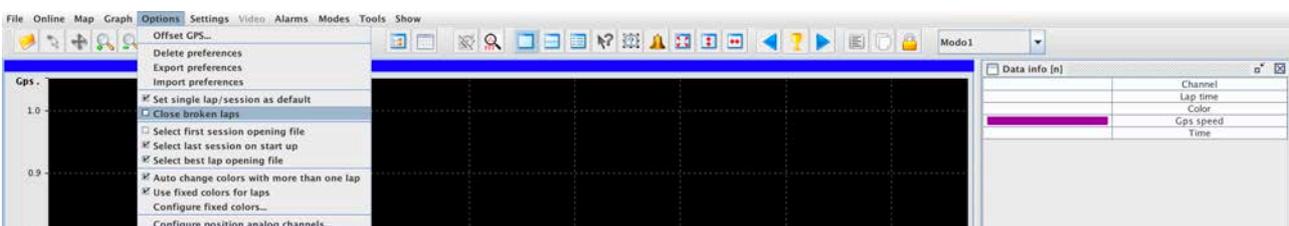
To do this, click on the highlighted button, then click with the left mouse button on the green peak and then with the right mouse button on the peak of the other lap, here is the result.



Danas Pro allows us to perform this operation even in continuous mode. We close and reopen the padlock to cancel the previous alignment, now instead of selecting the alignment function with the right and left button, we simply press the right mouse button and drag the curve where we prefer while holding the button down.

The functions of translating laps over time also allow us to solve a problem that unfortunately sometimes has to be faced: the analysis of a fall.

The first problem when analyzing a fall is that the lap in which you fell is not complete and therefore Danas Pro does not recognize it as a lap and does not allow us to compare it with the others to understand the differences. To solve this problem Danas Pro provides us with the "close broken laps" function from the options menu.



Through this function, Danas Pro allows us to consider even the last piece of acquisition as a lap. The lap, not being complete, cannot be displayed in space mode but can be realigned to the previous laps thanks to the functions just seen.

Ideal Lap

Let's go back to the previous condition where we had placed 4 additional splits and look again at the Sessions / Laps table. If we do not select any lap we can see how some of the numerical values of the split times are in bold. Those highlighted in bold represent the best split values.

Sel	Color	Session-Lap	Time	Length(Km)	Split1	Split2	Split3	Split4	Split5
<input type="checkbox"/>		1-1	2:54.811	4.377	0:41.974	0:20.888	0:21.012	0:22.725	1:08.210
<input type="checkbox"/>		1-2	1:49.457	4.329	0:24.044	0:20.397	0:20.011	0:21.593	0:23.409
<input type="checkbox"/>		1-3	1:45.953	4.364	0:20.652	0:20.334	0:19.992	0:21.617	0:23.356

Summary: BEST: 0:00.000 IDEAL: 0:00.000 AVERAGE: 0:00.000

If we now select the first two times we will notice that some values are in bold and italics. The times highlighted in bold and italics represent the best split times AMONG THE SELECTED ones.

In the same way Danas Pro shows us in the lower part of the window the best time, the ideal lap and the average value of the times, all always referred to only those selected.

Sel	Color	Session-Lap	Time	Length(Km)	Split1	Split2	Split3	Split4	Split5
<input checked="" type="checkbox"/>		1-1	2:54.811	4.377	0:41.974	0:20.888	0:21.012	0:22.725	1:08.210
<input checked="" type="checkbox"/>		1-2	1:49.457	4.329	0:24.044	0:20.397	0:20.011	0:21.593	0:23.409
<input type="checkbox"/>		1-3	1:45.953	4.364	0:20.652	0:20.334	0:19.992	0:21.617	0:23.356

Summary: BEST: 1:49.457 IDEAL: 1:49.457 AVERAGE: 2:22.134