User Manual

RaceStudio 3Analysis

Release 1.00

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1 – RaceStudio 3 Analysis in a few words

With the new RaceStudio 3 Analysis (from here onward RS3Analysis) automatic and perfect time data-video integration is available. In addition to this more data are available in a quicker way; this because the new".xrk" format contains more information than the old ".drk" one and the new software can better exploit ".xrk" format potentials The new RS3Analysis is quicker in finding the information and each view has been properly designed and developed to be more intuitive and user friendly.

Why does RS3Analysis ask to log in?
RS3Analysis has a new "log in" feature that provides new services and cloud sharing. New available services are, for example, weather conditions and forecast while cloud sharing include data, profiles, configurations, math channels, track segments and they can be shared among your PCs or among your friends, coach etc.

What about my previous data?
RS2Analysis is still available and will be for a while. With the new RS3Analysis software previous data can be imported and analysed. You can import entire folders as well as single files browsing your PC.

What do I see first?
The first page that you see when running RS3Analysys is Database page, with data and videos of the sessions central, grouping criteria and collections on the left and the preview on the right.

What are RS3Analysis session collections?
With the new RS3Analysis you can group your sessions in different ways as shown in the software home page.
Recent session collection, collects the most recent sessions you interacted with. This means that if you recently worked on an old session that was particularly important you do not need to look for it again: you find it in the recent sessions.
Smart collections group sessions following a rule you can decide, like all sessions performed by a racer or on a track or belonging to a championship.
With Manual collections sessions are grouped as you wish, without the need to fix any specific criteria. Just drag and drop the session in.

What is the new preview feature?
The new RS3Analysis software features a new preview window that shows, according to the session mode it is showing and without needing to open the session, a lot of different windows.

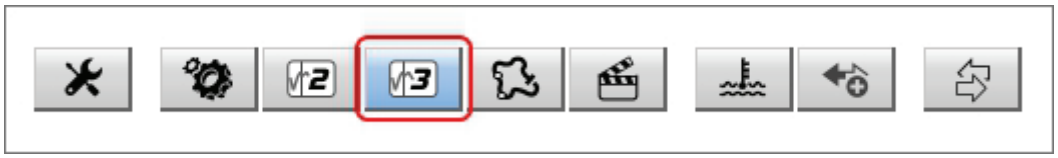
What about the new Analysis window?
The new analysis window shows, in the same window: channels tables, web-based map of the circuit, channels graphs of RPM and Speed (you can change this view through the profiles) and video of the race if available. All view can be changed and its setting saved as a "Profile" that you can apply to any session you open. Pressing the space bar you can hide/unhide the channels tables left of the page.

Can I see the graphs of my movies?
Yes. You can also place the movie in the centre of the page with the desired graphs synchronized bottom of the movie.

Please note: being Movies Layout (chapter 4) the most complete layout we suggest to read it as reference for any explanation of the layout you need.

2 – RS3Analysis log in and database

RS3Analysis is the analysis software included in Race Studio 3 software. To reach it run Race Studio 3 and press RS3Analysis icon on the top left keyboard, highlighted here below.



As shown here above RS2Analysis will remain available for a while so that the user can pass to RS3Analysis when feeling enough confident.

2.1 – RS3Analysis Log in feature

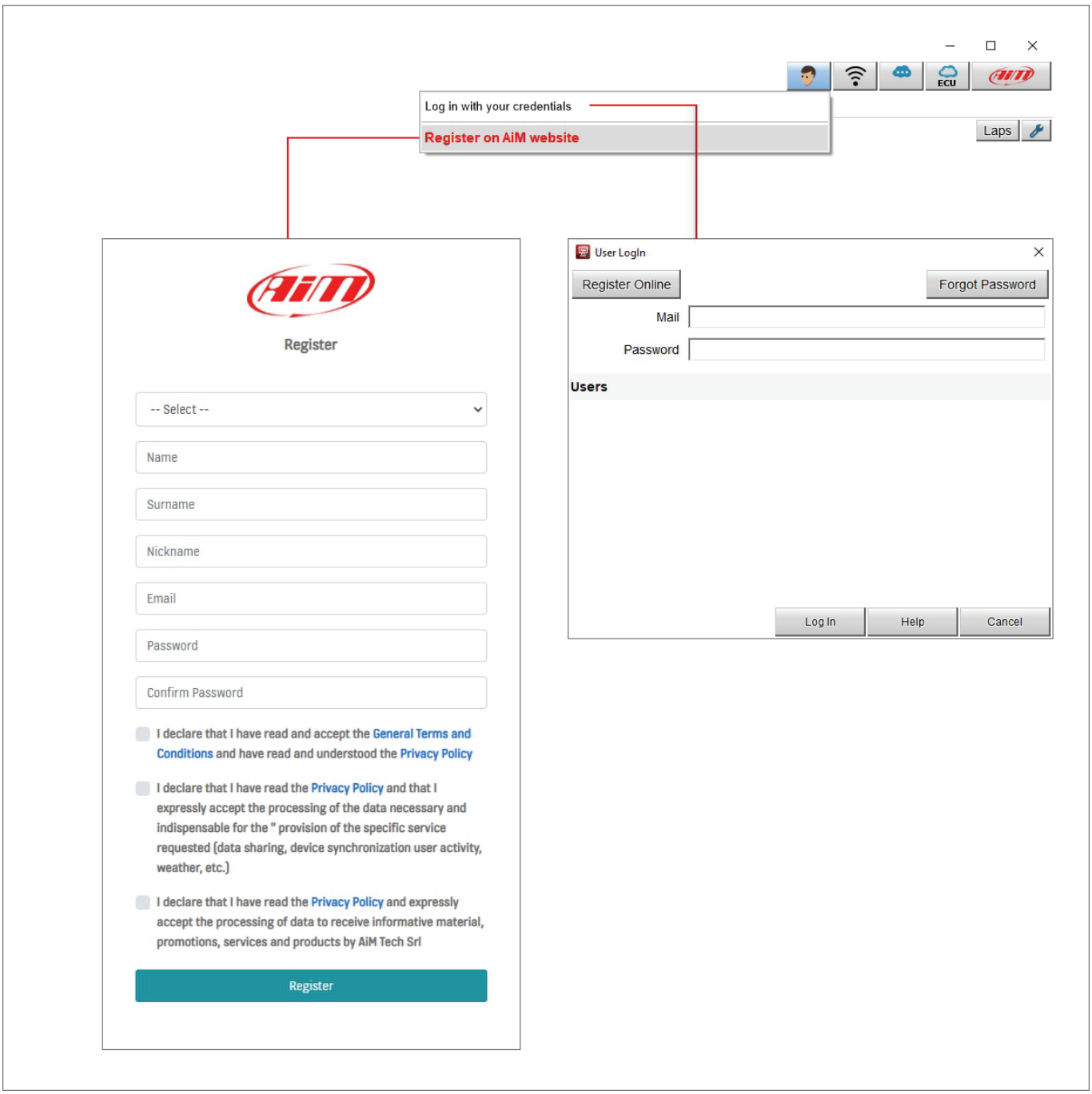
The new RS3Analysis comes with the new "Log in" feature that can be activated on the software top right keyboard.

With this new feature the user connects to AiM server where some information are saved, like these concerning the weather conditions in a free cloud space of some megabytes. They are to allow you testing this feature. In the future additional space will be available for purchase.

This feature provides the user with a free cloud space where to save his personal profiles (paragraph 3.1), tracks, math channels (chapter 11) and sessions (paragraph 2.2).

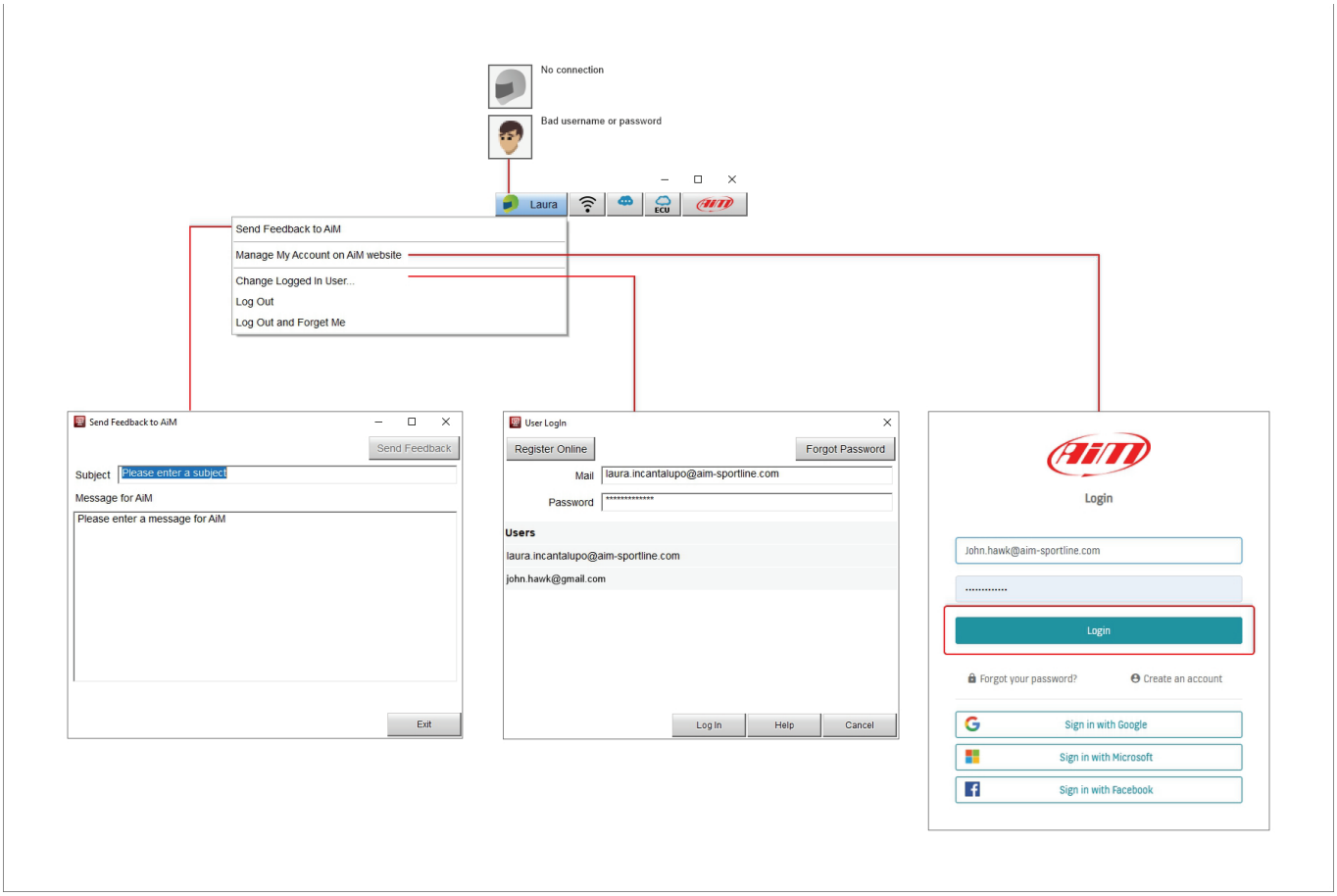
At present log in allows to synchronise your devices but AiM is working to allow you sharing your data with other user.

At the very first use “Log In” icon is as shown above and it opens a menu. If you do not have the credentials select “**Register on AiM website**” and fill in the dialog window that appears (on the left in the image below); a registered user has to select “Log in with your credentials” and fill in the “User LogIn” dialog window (on the right in the image below).



Once logged in you have an account on AiM server and the login menu changes. Also the icons can be different in different situations like bad user name or password or no connection available.

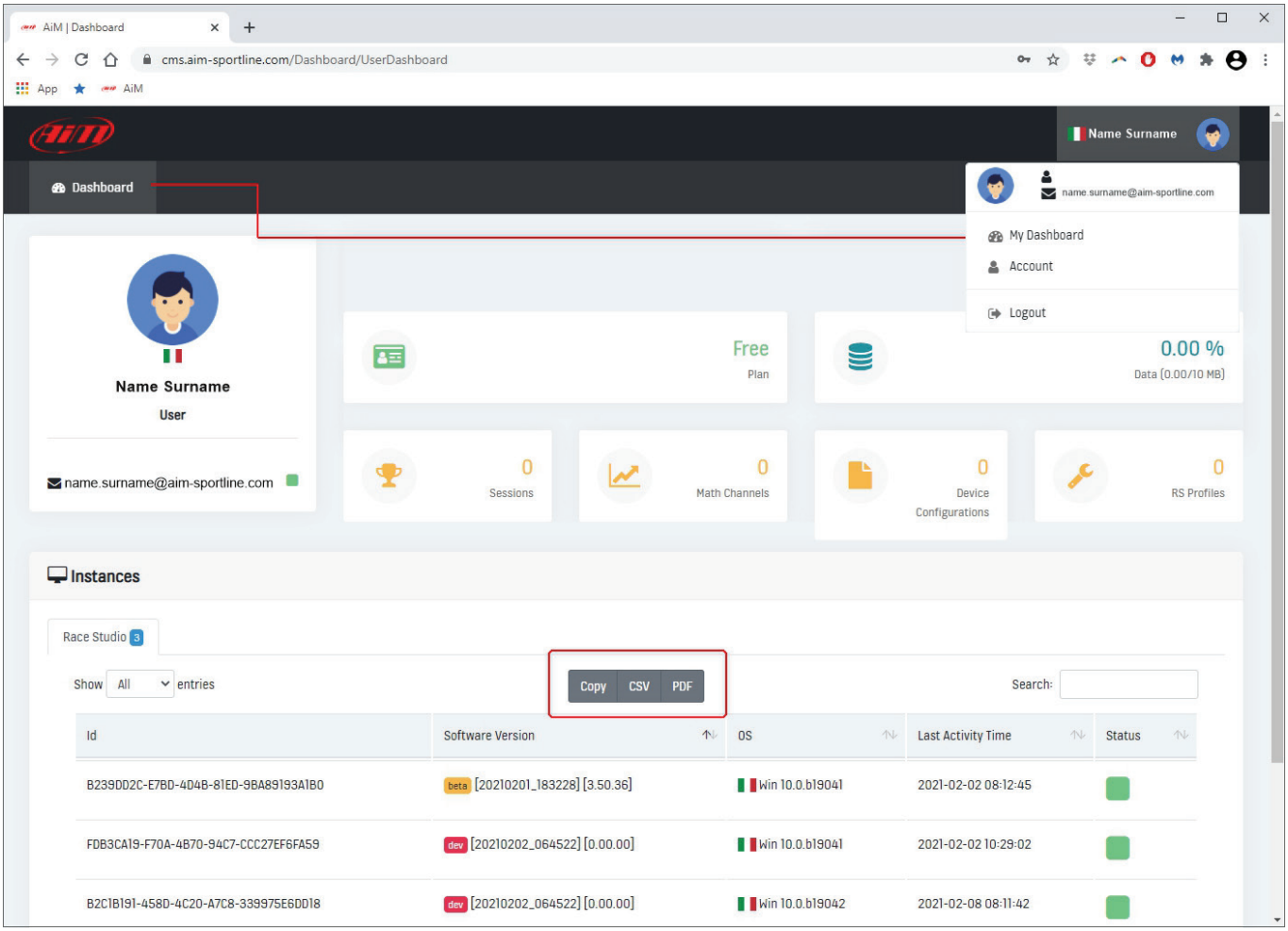
Once the registration procedure correctly performed you have different options.



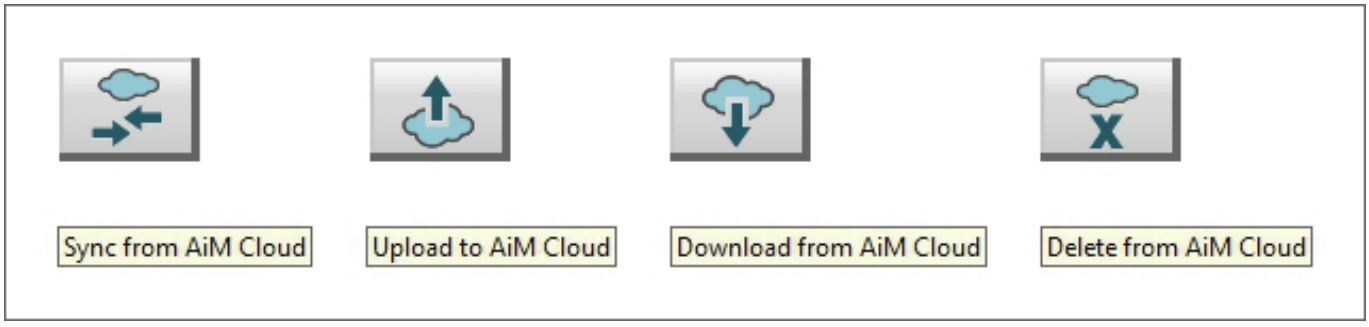
- **Send a feedback to AiM**: a dedicated dialog window is prompted; you can define a subject and write a message that goes directly to AiM technicians
- **Change logged user**: assumed you have more accounts you can switch from one user to the other without having to shut down the software
- **Log out**: logs out but keeps user data on AiM server to allow log in the next time
- **Log out and forget me**: exit the software and removes user data on AiM server; the next time the user will need to register again
- **Manage your account on AiM website**: it opens a login page on the Internet; logging in the user enter a personal dashboard shown in the following page.

The software re-directs the user to his dashboard on the web.
Here it is possible to:

- see all information the user uploaded
- copy the instances or download them in different formats: CSV, PDF
- update user information selecting “Account” option on the top right button of the page; the related page opens and data can be updated and saved at the end
- logout

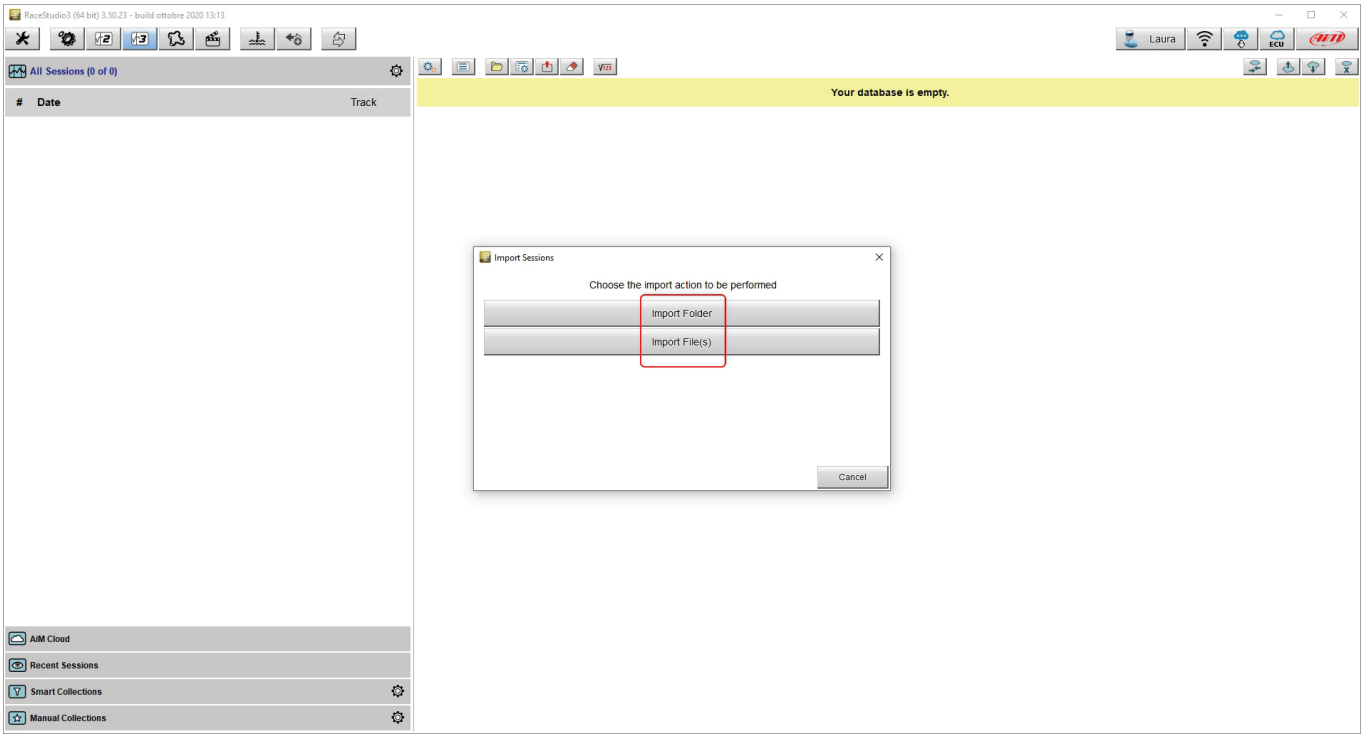


Cloud options are indicated by icons, shown below, that appears only when you need them.



2.2 – The software database

RS3Analysis is typically run after data download and this means that the software database populates automatically but previous data can also be imported from an external drive. In this case at the very first time the software database is empty and this dialog window is prompted.



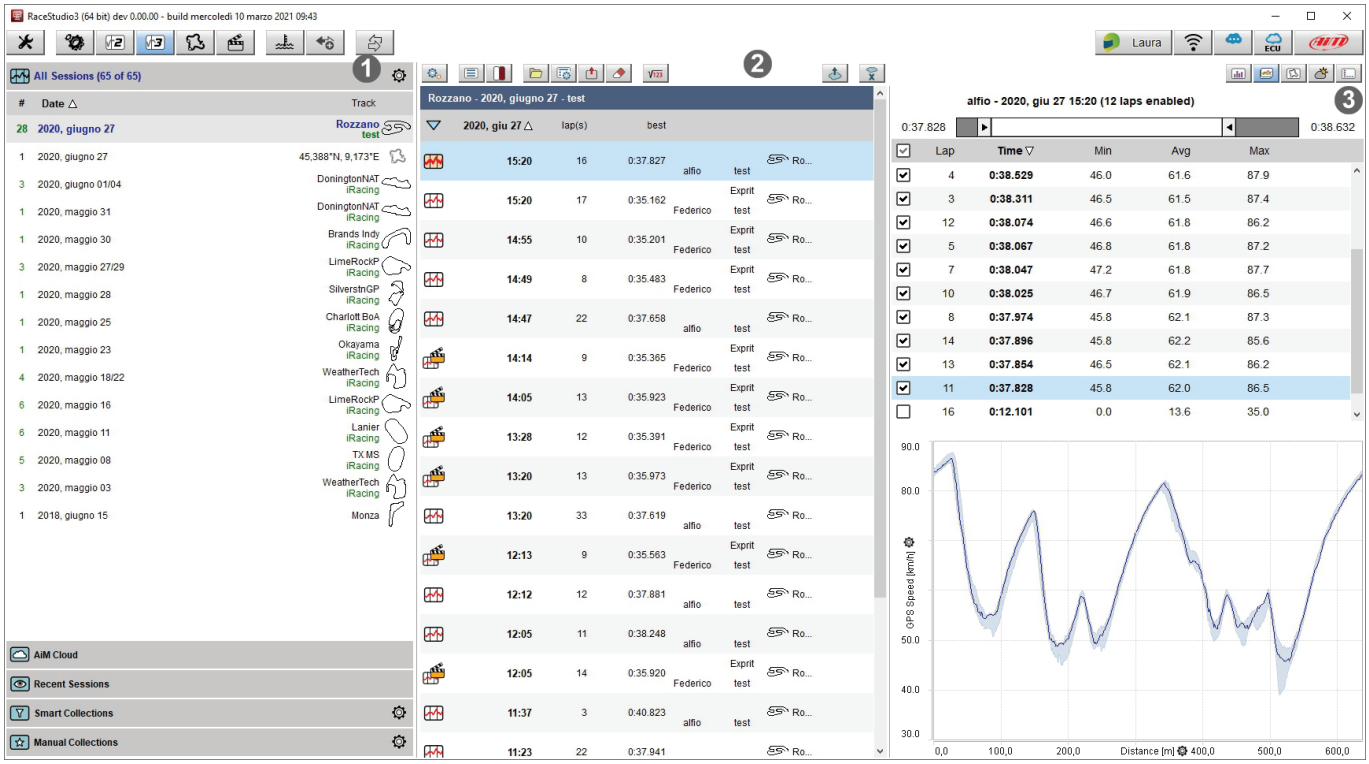
It is possible to import single files or entire folders of data.

Pressing one of the buttons highlighted browse windows is prompted: select the file/folder to import and press OK.

A panel with a progress bar appears. In case the files are already in the database or if there is any issue the software warns.

RS3Analysis home page is divided in three parts:

- on the left all available sessions with grouping criteria and collections where the desired one can be selected (**1**)
- central data and video of the selected session (**2**)
- right the selected session data preview (**3**)

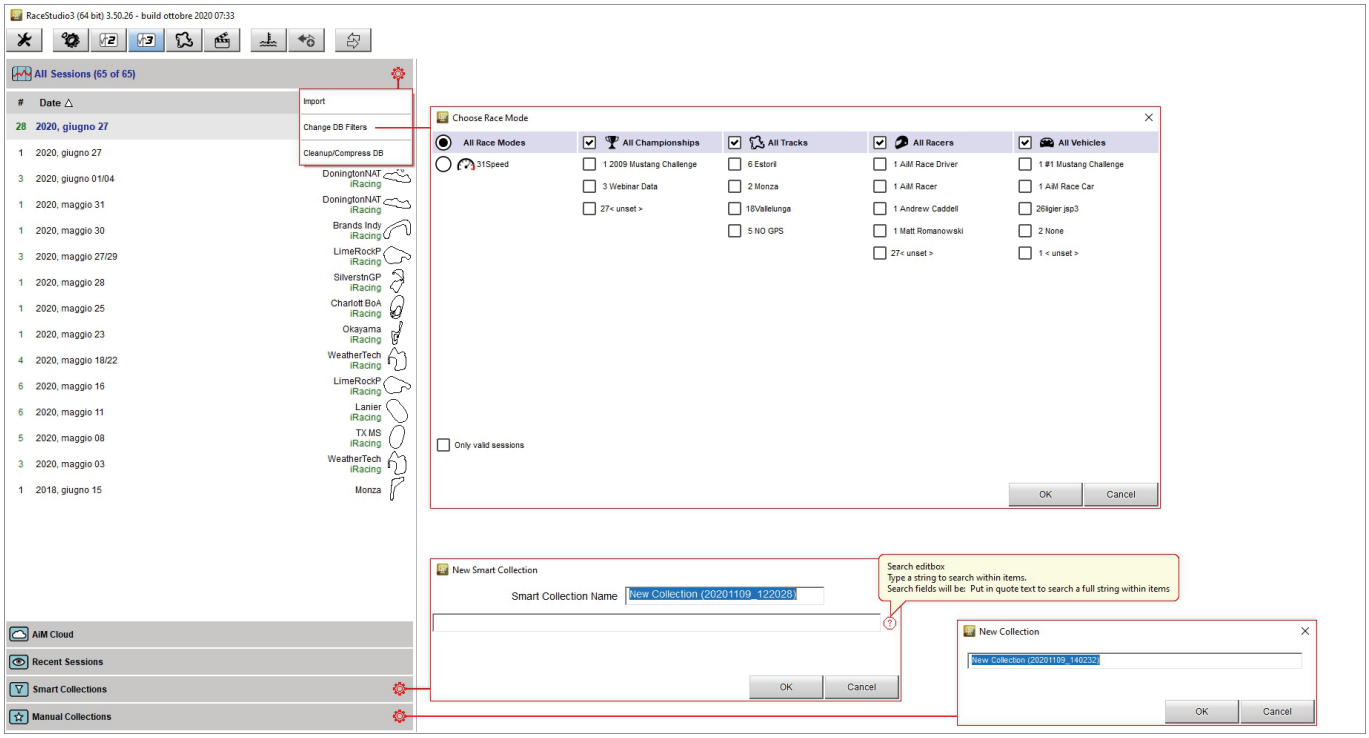


2.3 – Sessions database

When the database has been populated **all sessions** are shown by default (top bar); they are grouped into events (by week) on the same track/race. Clicking the setting icon a menu is prompted. Here it is possible to select which Session to show according to the selected race mode.

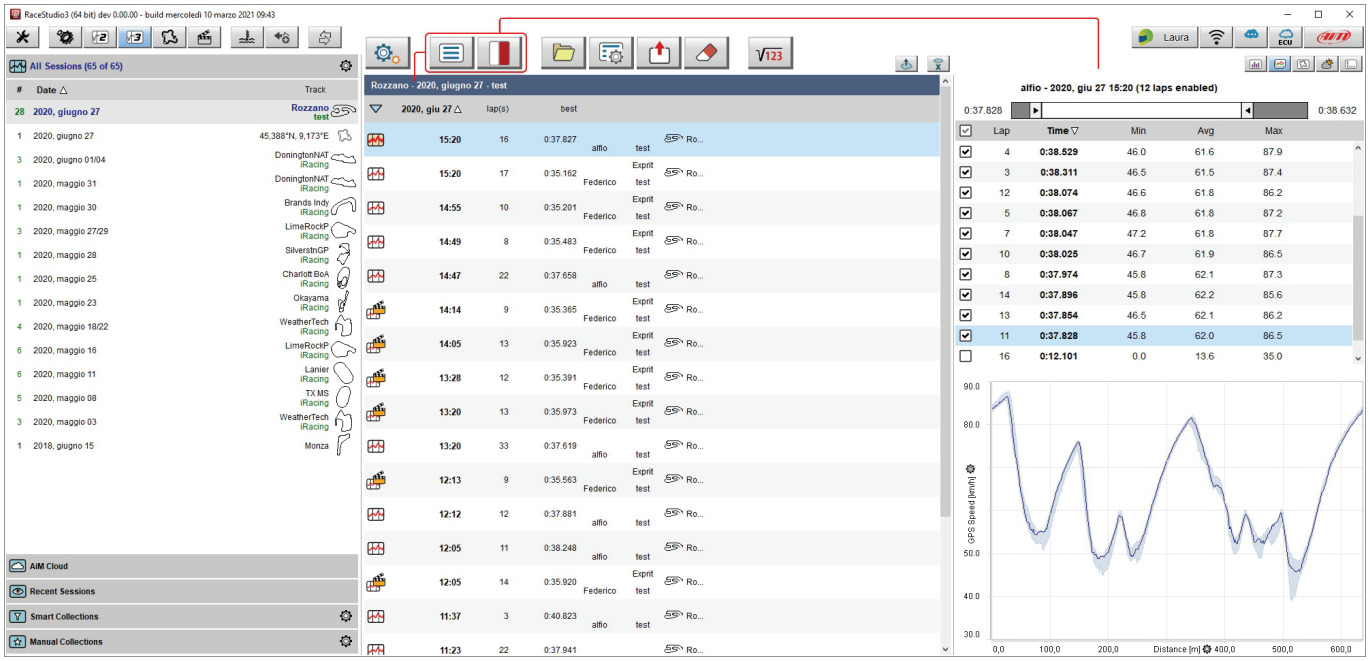
Bottom of this part of the page are other session types:

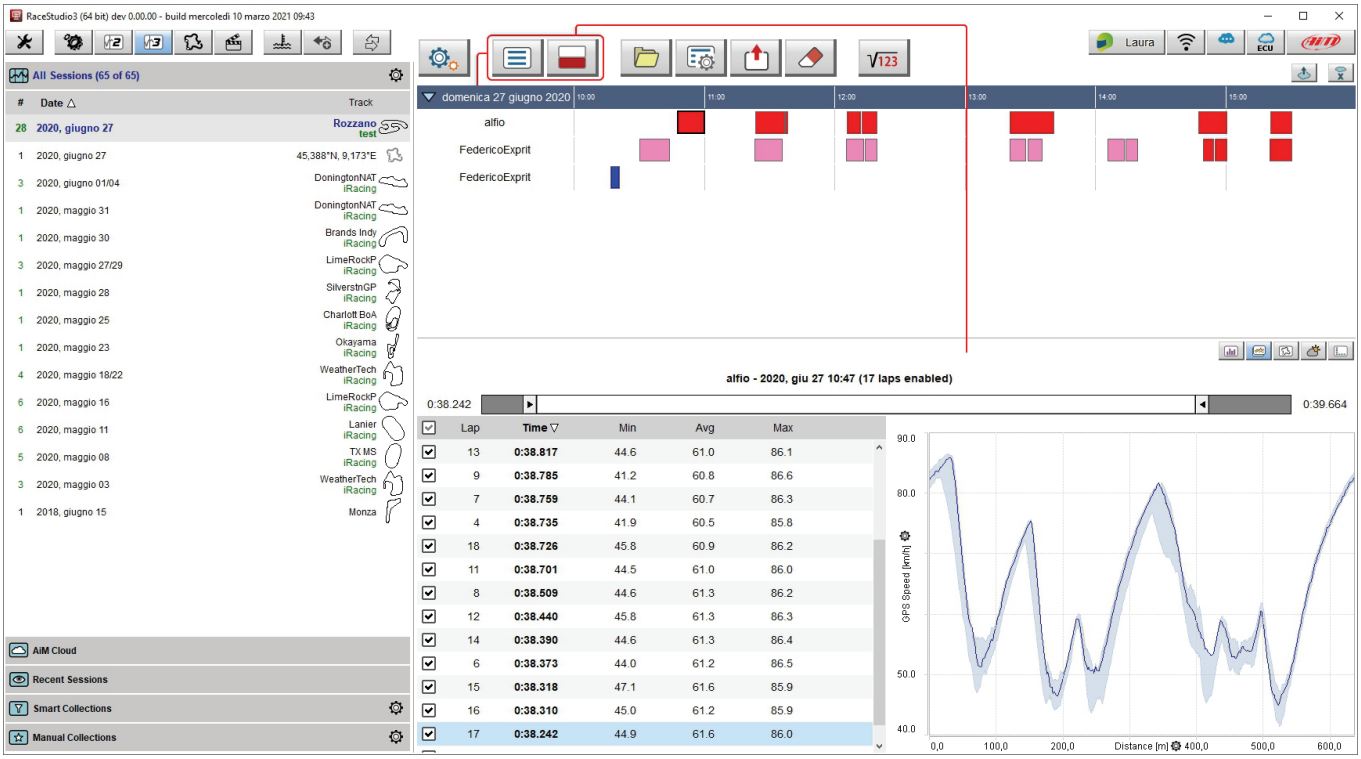
- **AiM Cloud**: shows all sessions uploaded on AiM cloud
- **Recent sessions**: this database remembers the last 30 sessions you have interacted with; the very first time is empty
- **Smart Collection**: this database can be build clicking the setting icon and selecting the sessions according to a custom criteria; as shown by the pop up that appears clicking on the question mark you can fill in a text to be used as search string and the sessions corresponding to that string are automatically included in the new smart collection; default collection name is day and time but it can be named as wished
- **Manual Collection**: this database in manually build;
    - click the setting icon on the right
    - a dialog window is prompted: name it and the collection appears below the Manual Collection label
    - click "All sessions" to show all available session and drag and drop the sessions you want to include in it.



2.4 – Selected session

When the session to view is selected it appears in the **central** part of the page. The session view can be list or agenda and the different preview window can be shown right or bottom. The following images show: list/right view on top and agenda/bottom view bottom.

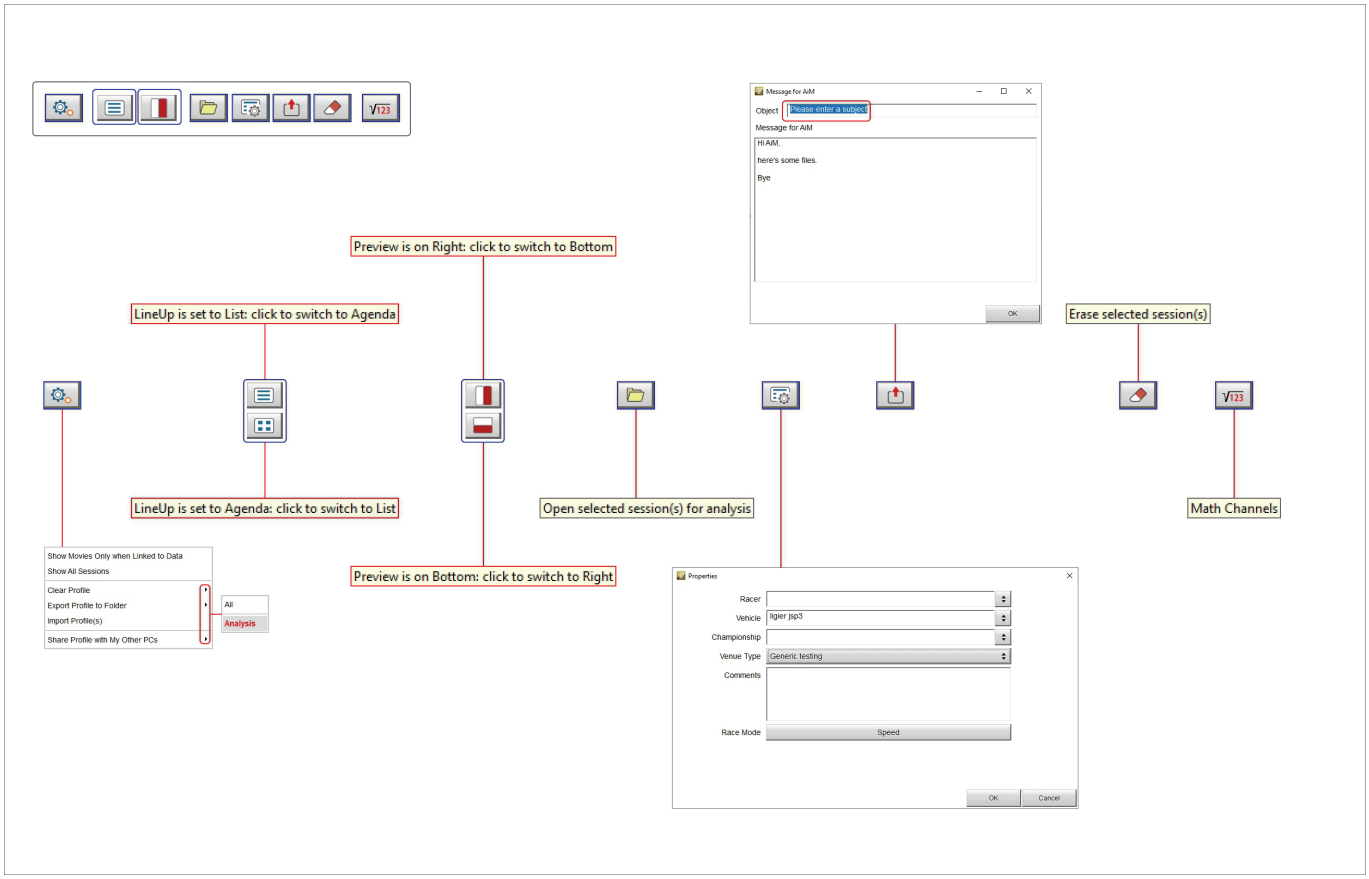




Top of "Selected session" column is a keyboard, shown in the image below whose buttons are for:

- **View** button: allows you to choose what sessions to show: available options are:
    - Show movies only when linked to data (appears only if the selected session contains video)
    - Show all sessions
    - Clear Profile (All or Analysis*)
    - Export Profile to folder (All or Analysis*)
    - Import profile(s)
    - Share Profile with my other PC (All or Analysis*)
- **Switch view** button: allows to switch the view from list to agenda
- **Switch preview** button: allows to switch the view layout; you can have preview windows bottom of the sessions list or on the right of it according to the setting you select; in this manual we are going to use the "List/Right" setting
- **Open** button: open the selected session for analysis
- **Properties** button: allow to modify the properties of the selected session using the dialog window that appears
- **Send to AiM** button: it activates a dialog window when it is possible to insert an object and a message addressed to AiM support that makes easier and quicker for AiM service to investigate the problem.
- **Erase** button: erases the selected session
- **Math channels** button: opens math channels dialog window (see chapter 11 for further information).

***Please note:** "**Analysis**" is the default name of any profile; this means that as you save the profiles with names, "Analysis" option is replaced by a list and you can select the one to clear, export, import or share. Any operation can be performed on one profile at a time only.



The selected session is shown in the central column and RS3Analysis automatically recognizes which data it includes matching each session to the dedicated icon. Here below all icons are shown.

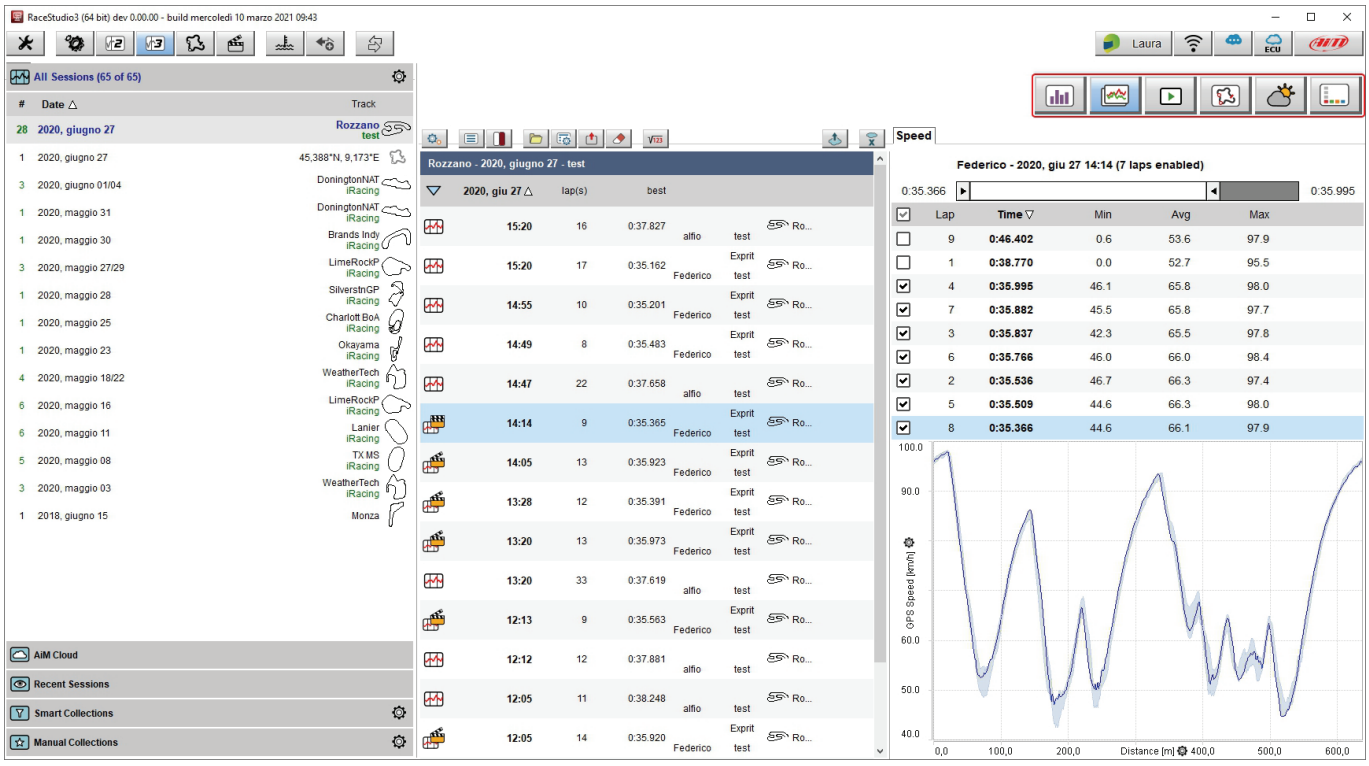
Data session icon

Data and video session icon

Video session icon

Sim Racing session icon

Data preview of the selected session is shown right of the page. It changes according to the key pressed on the keyboard placed right of the page straight above the data and highlighted in red here below.



The keyboard buttons show different preview and if the session has no video in it the corresponding button is hidden.

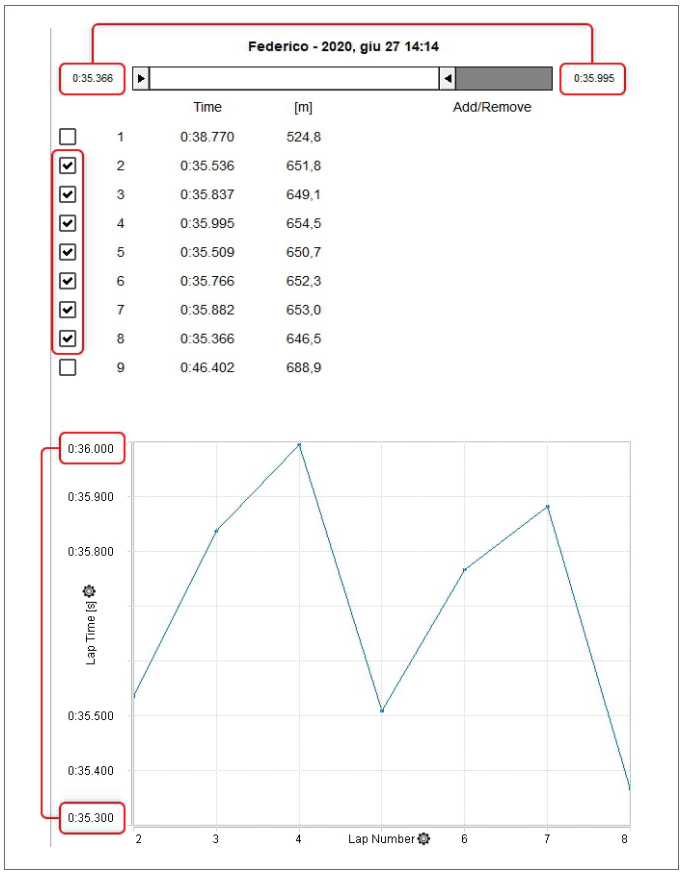
2.4.1 – Laps summary preview

Laps summary preview shows by default all the laps except for the first and the last one (left image below) and the related max/min lap time values are indicated side of the top sliding bar and in the bottom graph.

Sliding the top bar only laps in a fixed lap time range are shown (right image below). This range is shown in the bottom graph too. It is possible to add/remove channels to the central table using the button you find right under the sliding bar.

The bottom graph shows, by default, Lap time on the ordinate axis and lap number on the abscissa axis.

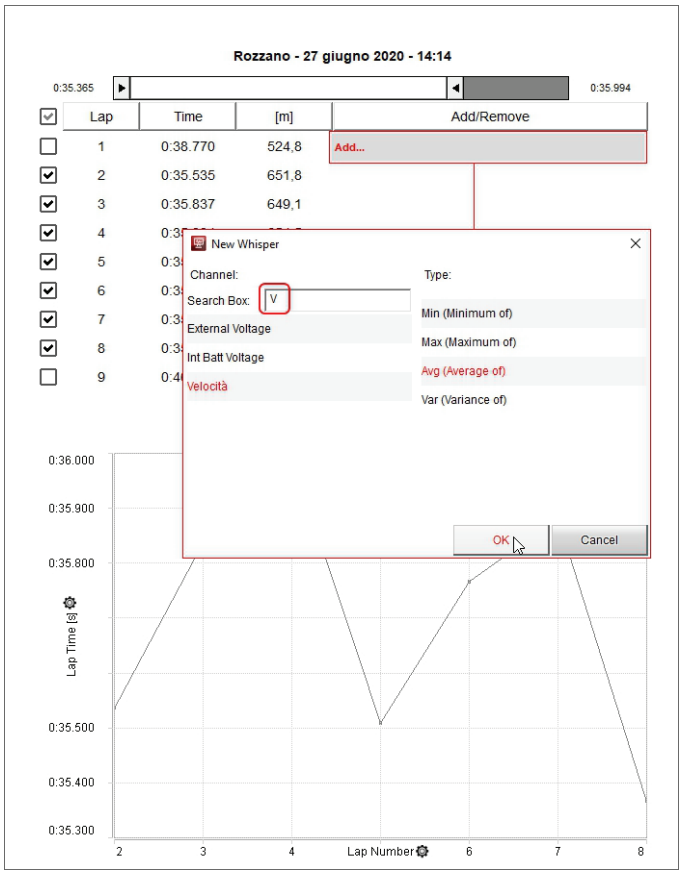
The graph can be zoomed in/out using the mouse wheel.



As shown here below on the left, to add a channel:

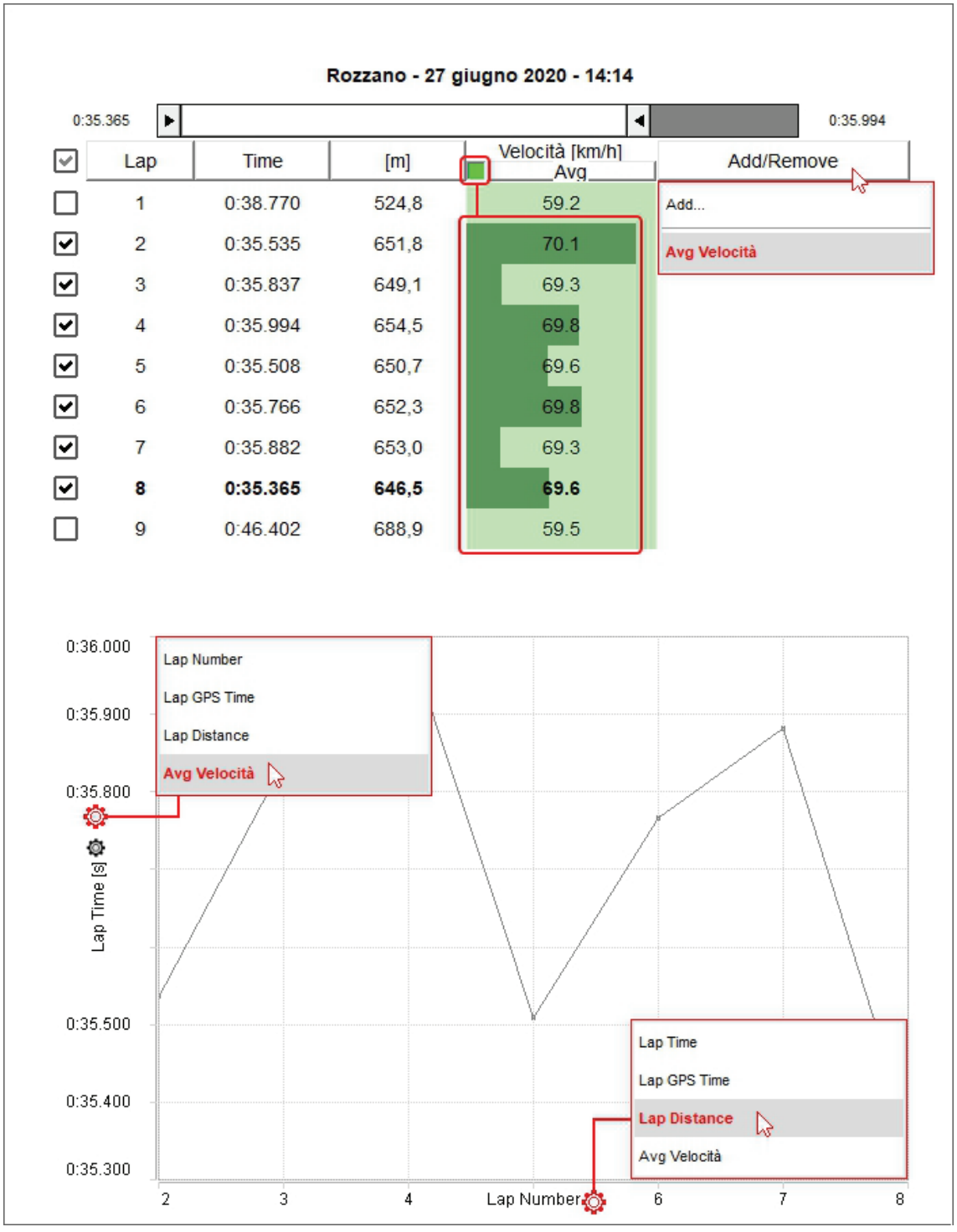
- Click “Add/Remove” and select “Add”
- Select the desired channel in the list or search for it filling in “Search Box”
- Click “OK”

The channel appears in a new column as shown here below on the right.



When the desired channel has been added the software allows you to perform the following actions:

- show the histogram of the added channel as background of the column clicking the checkbox top of the same column
- remove the added channel clicking “Add/Remove” button and selecting the channel to remove
- change the channels plotted on the graph clicking the setting icon on the axis and selecting the channel to plot

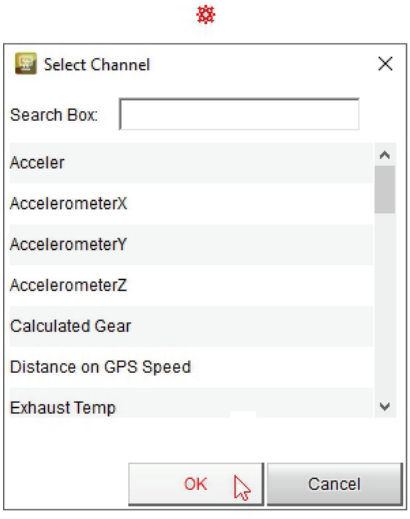


2.4.2 – Laps report preview

Laps report preview shows the laps ordered by lap time by default and sliding the top bar you can select only laps in a fixed lap time range as well as show them in the graph below the laps list. Mousing over the laps list the graph of the lap you are mousing over becomes red in the graph below.
The graph shows, by default, GPS Speed on the ordinate axis and Distance on the abscissa axis. To change the channel plotted on the ordinate axis click the related setting icon (red below) and select the channel to plot in the dialog window that is prompted (on the left in the image below.

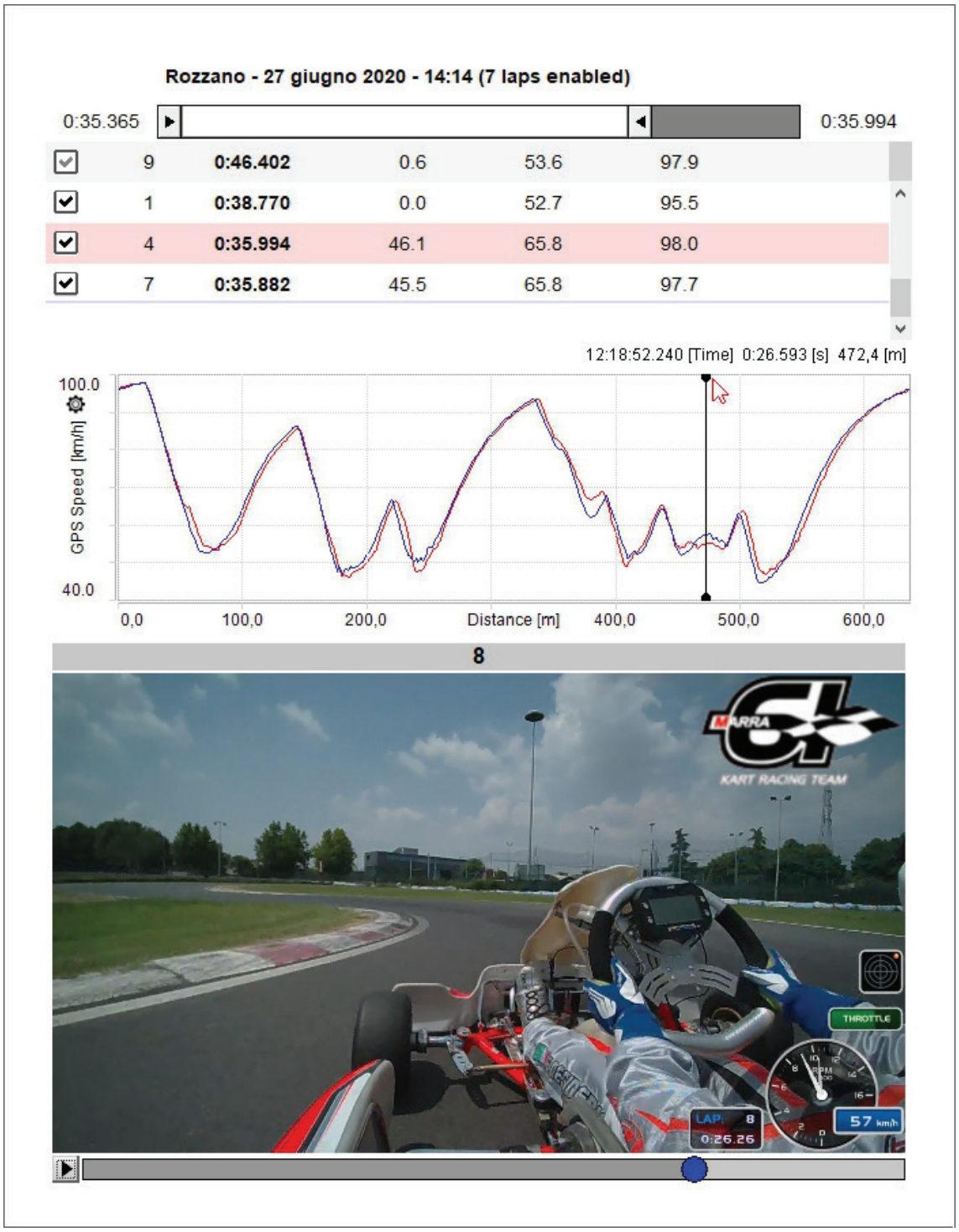
The graph has a sort of grey/light blue background that highlights the range set with the top sliding bar. To hide this background click the setting icon on the abscissa axis (green below) and then click "Hide Area".

The graph can be zoomed in/out using ctrl+the mouse wheel.



2.4.3 – Video preview

Video preview works mostly like the previous two. Pressing “Play” button bottom left of the preview, the video plays and the cursor on the central graph moves simultaneously. Clicking on a point in the graph the video goes to that point .



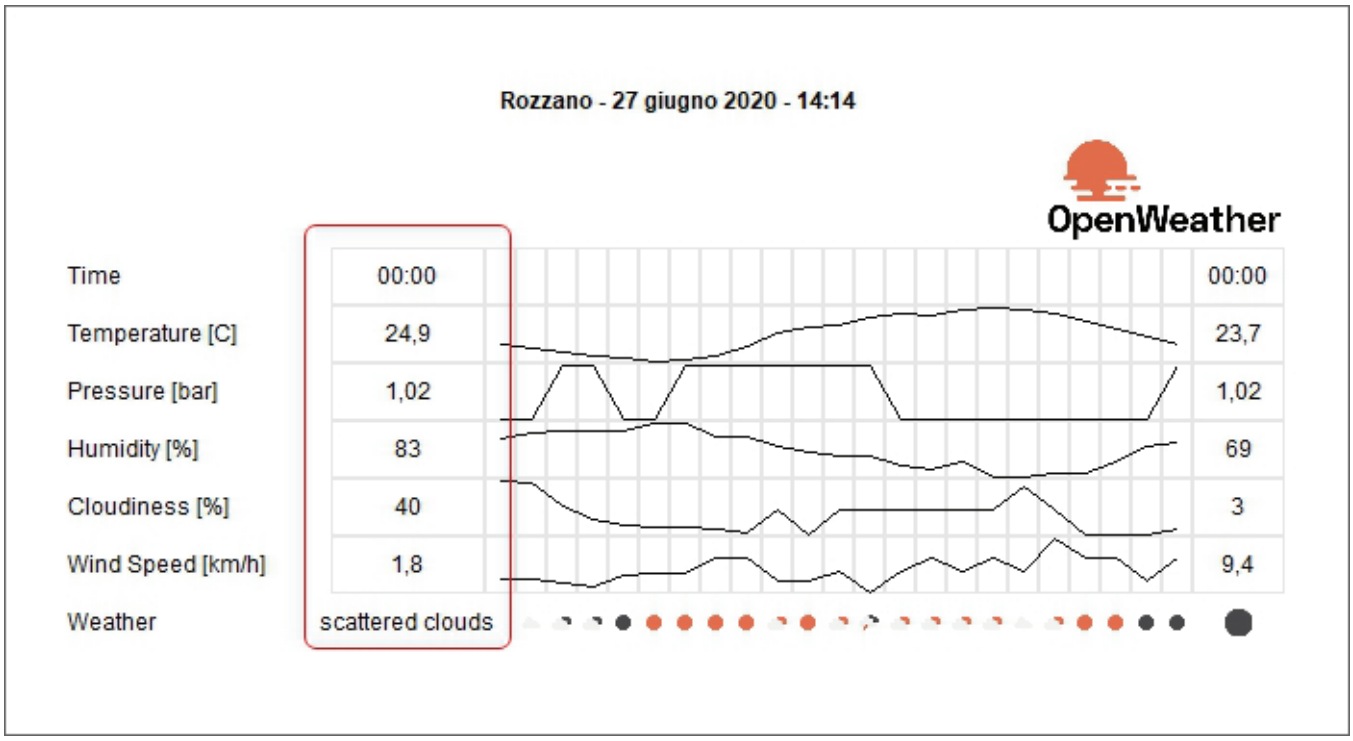
2.4.4 – Map preview

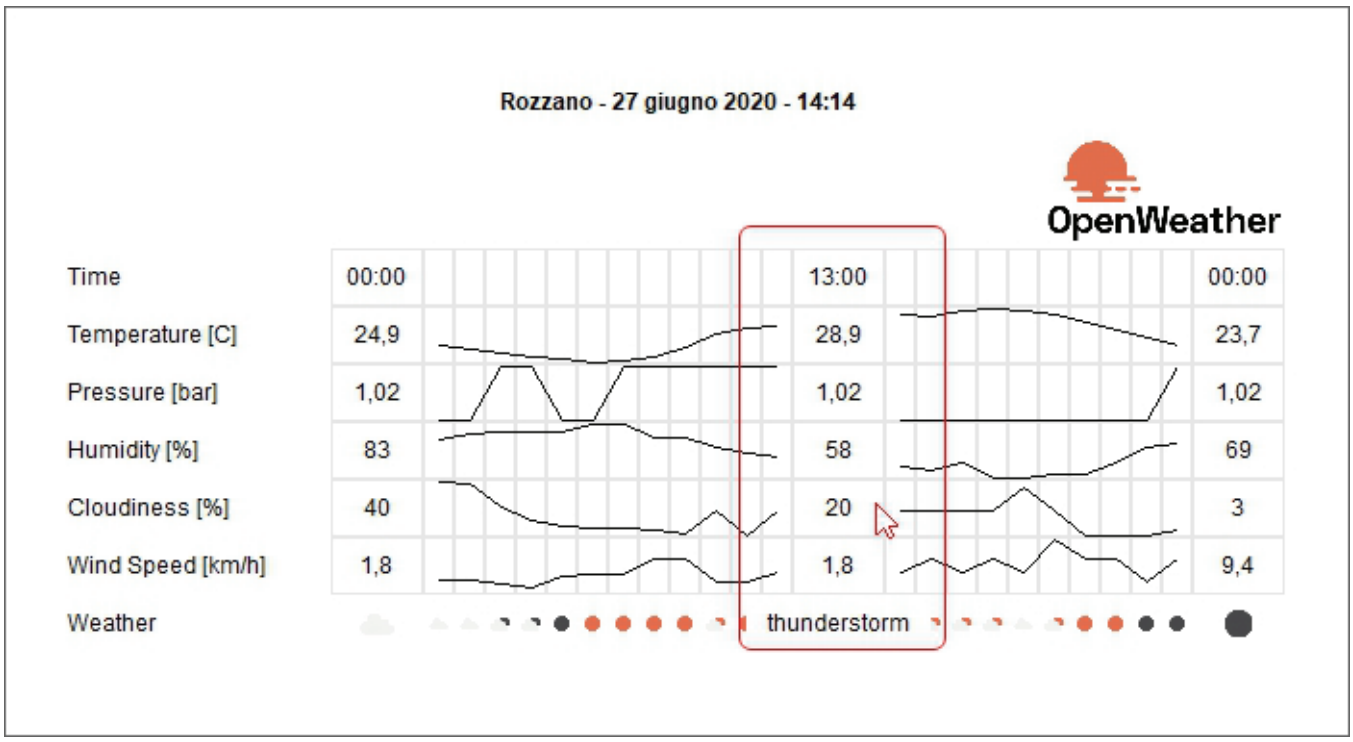
Map preview shows the track map and you can:

- center the map in the window
- zoom in/out the map using the related buttons or with the mouse wheel
- change the map tile provider choosing among the options shown here below (in the example Google Maps is being used)
- switch among web mapping and drawn map (the top right button in the image below changes according to the view)

2.4.5 – Weather preview

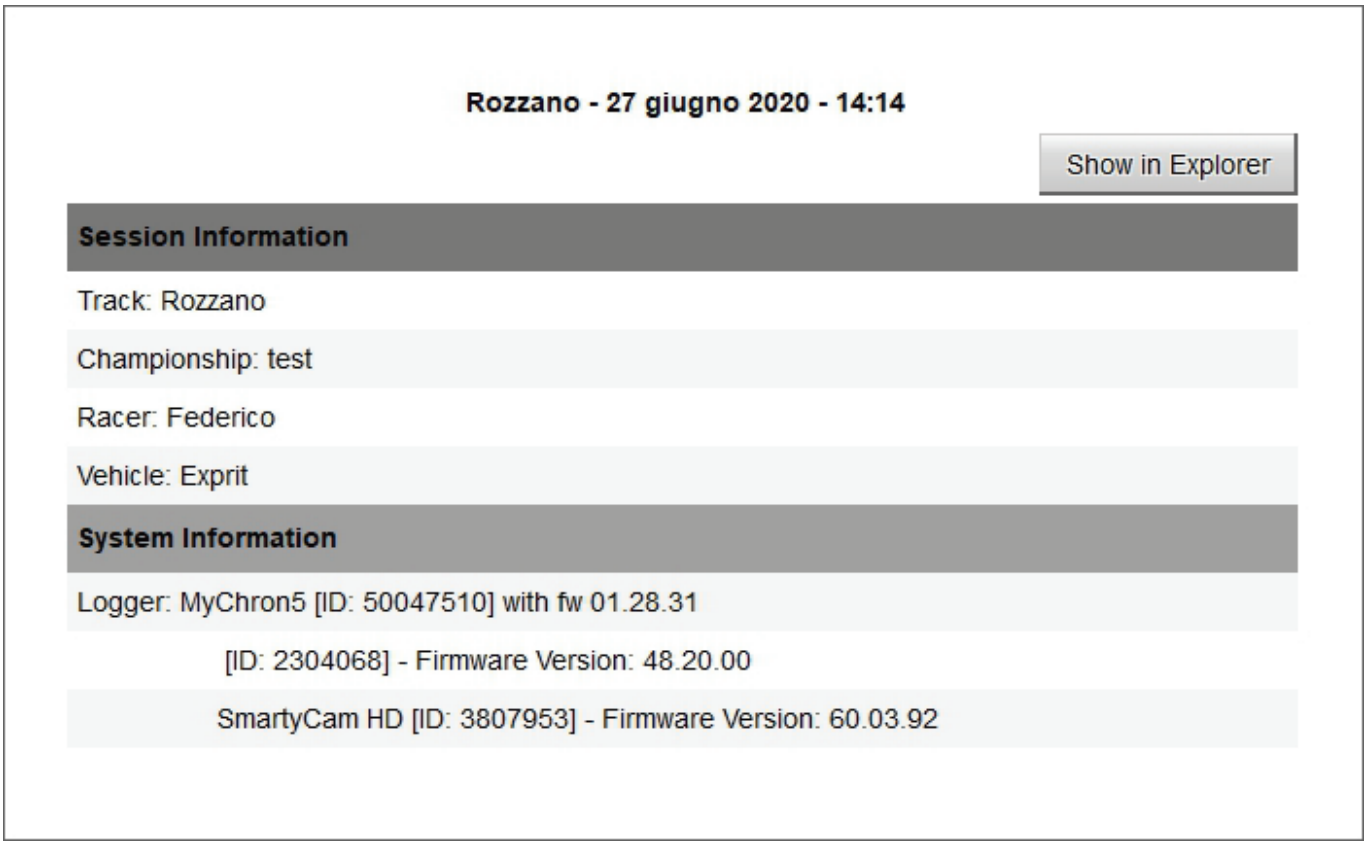
The weather preview shows all information about the weather conditions in the date of the race, from midnight to midnight. These information are available for 12 months from the day they are recorded.
Mousing over the graph the weather conditions during the day are shown (bottom image below)





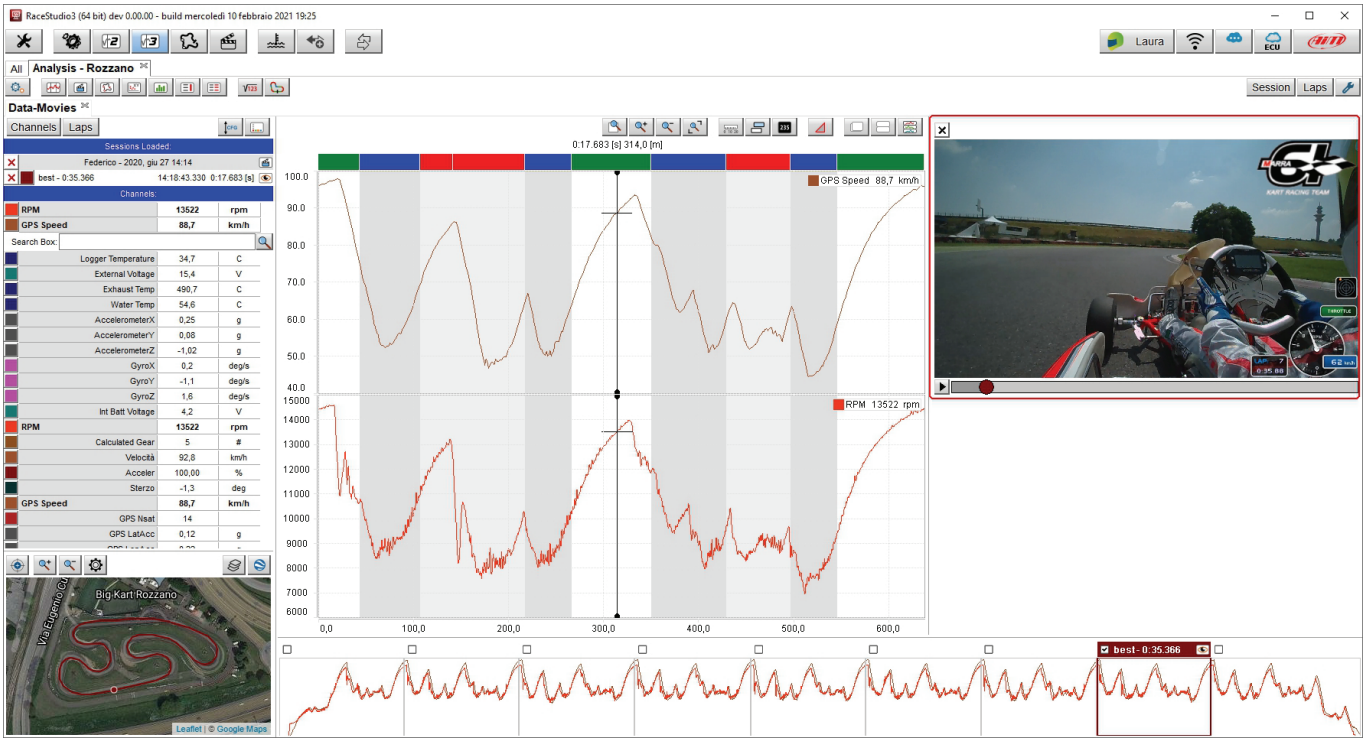
2.4.6 – Advanced Info preview

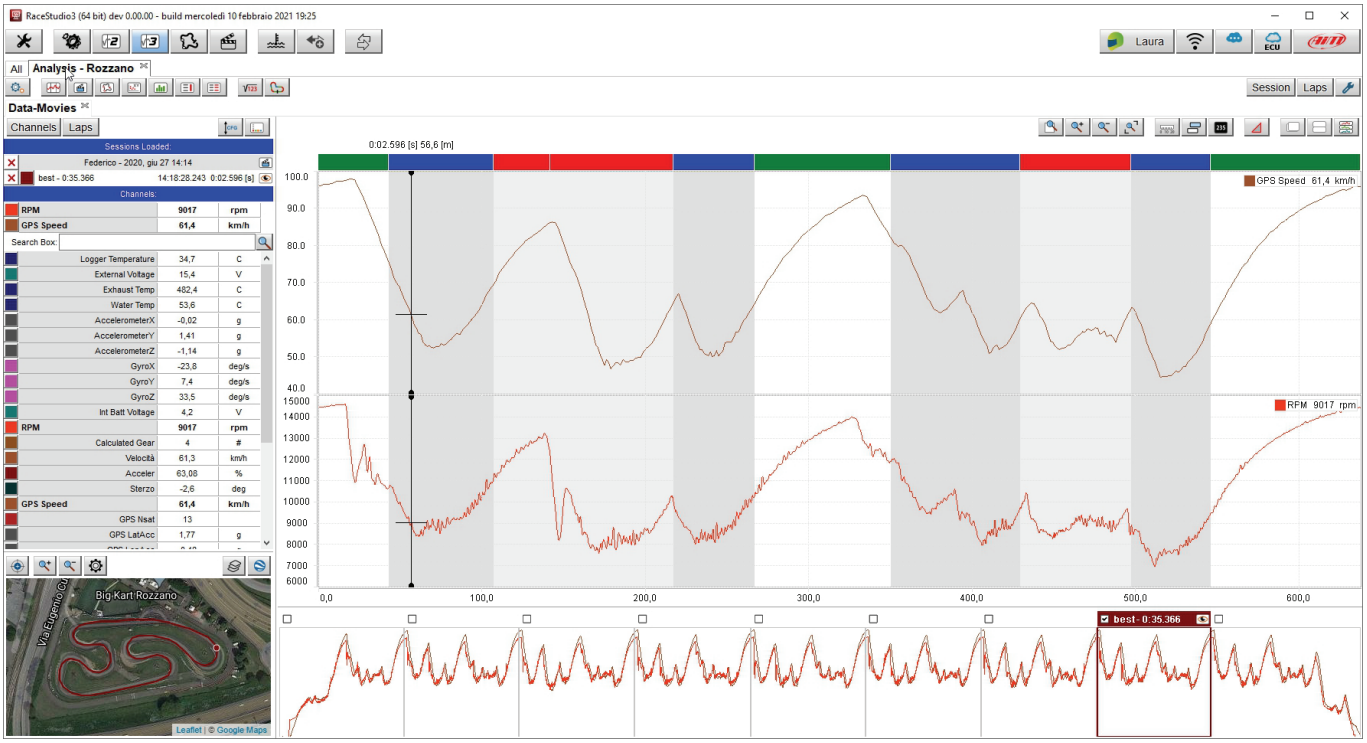
Advanced info preview shows all the information about the session according to the logger in use.
You can also see the files containing the data in their folder clicking "Show in Explorer". If a SmartyCam HD is connected to the logger two explorer windows will open: one for the racing data, the other for the video .MOV file except files are saved in the same folder and in this case they appear both selected.



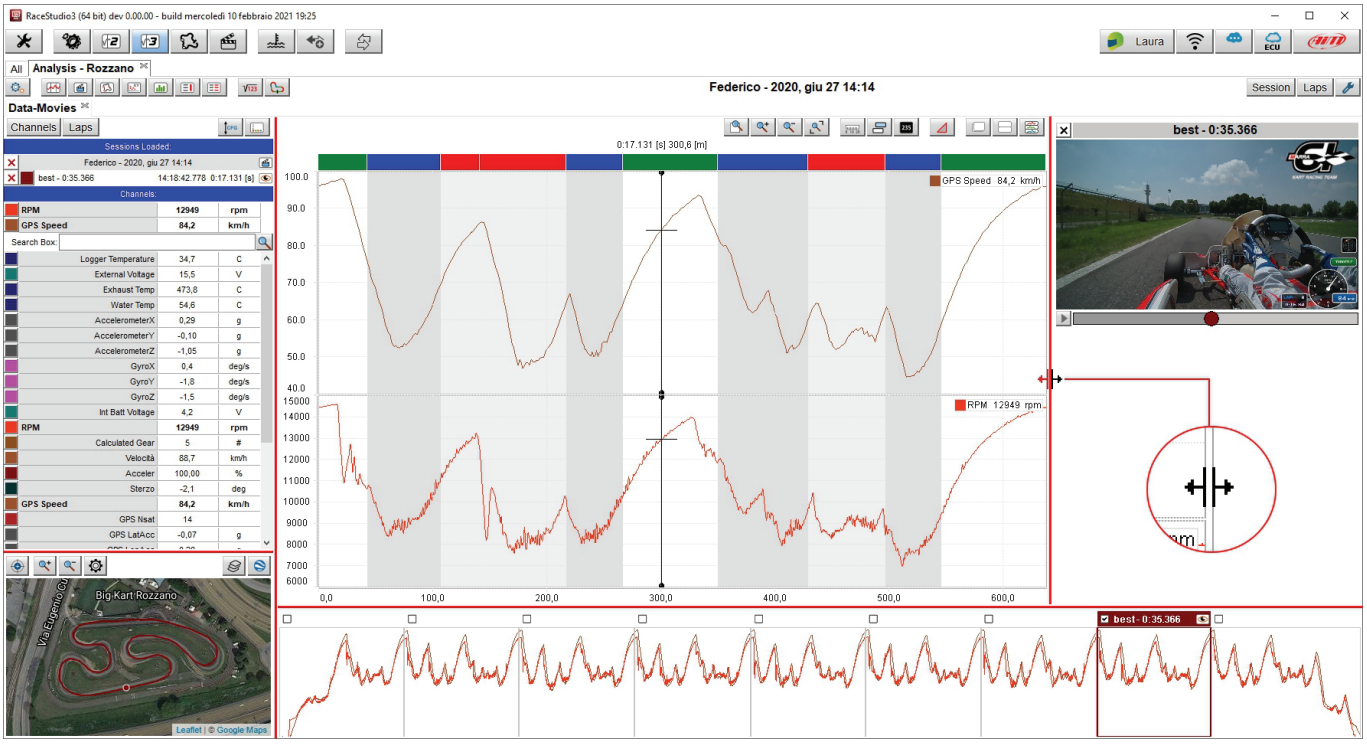
3 – Analysis views

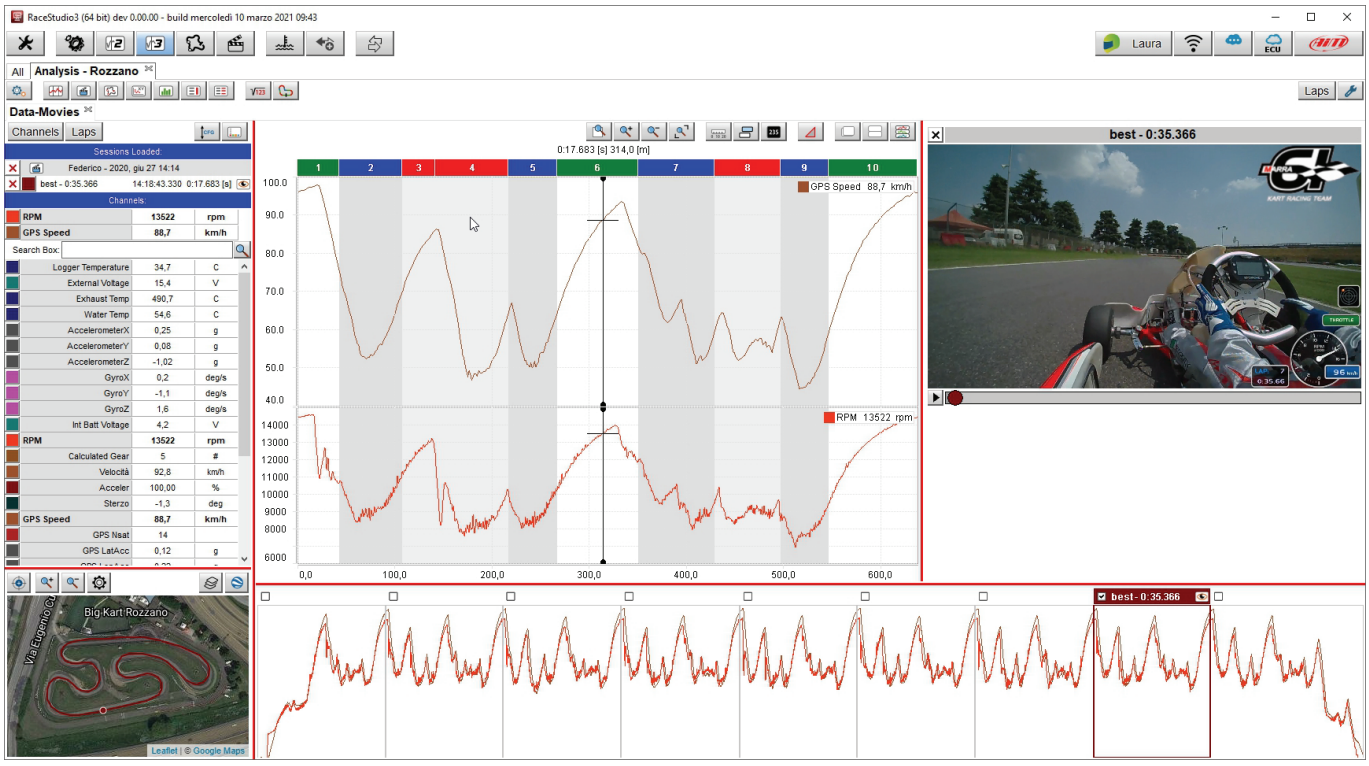
To open a file and start analysing it double click on it and “Analysis” view opens. The default view changes depending on the presence or not of a video in the file. If there is a video (top image) “Movies” layout is prompted with the video top right of the page while if there is no video (bottom image) “Time-distance” layout opens.





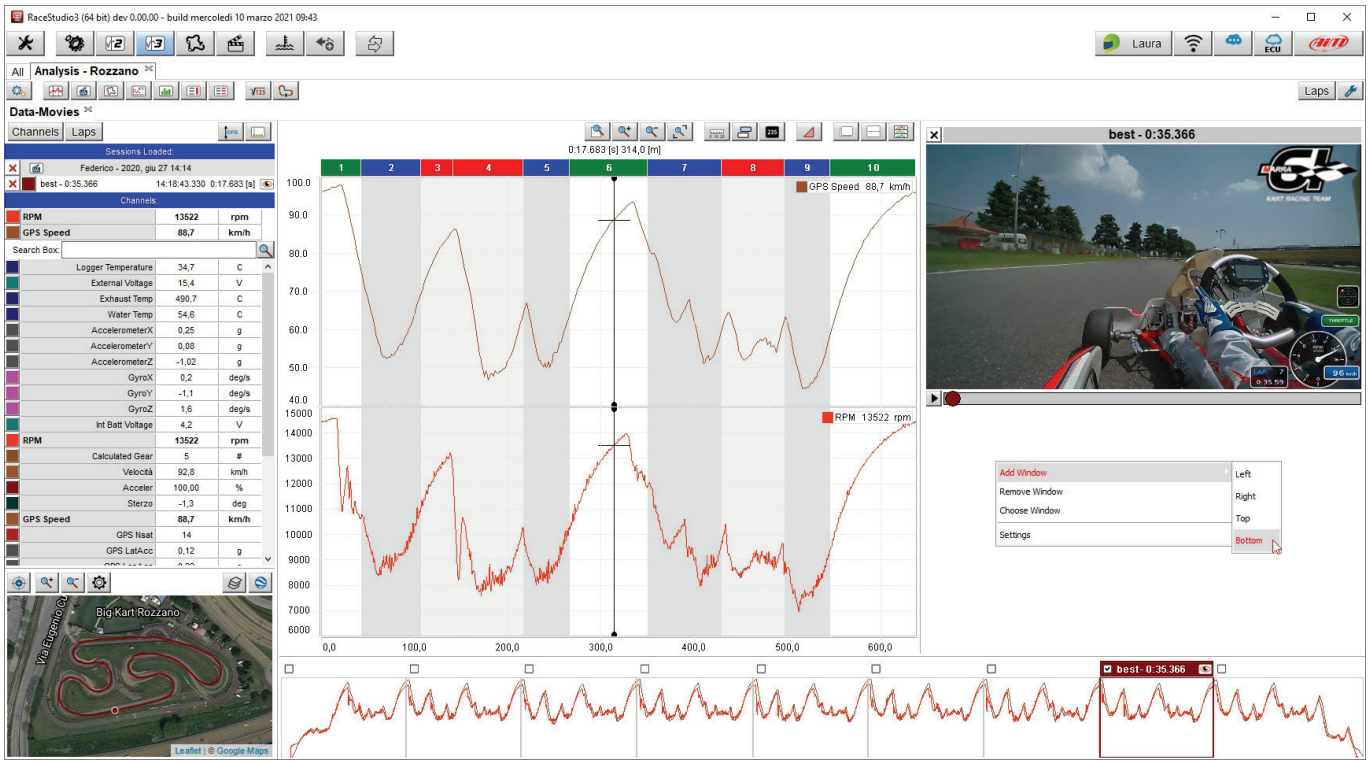
The different parts of the view can be resized in width and hight using the split lines highlighted in red in the images below.





It is also possible to add/remove a window in the view. To **add** a window:

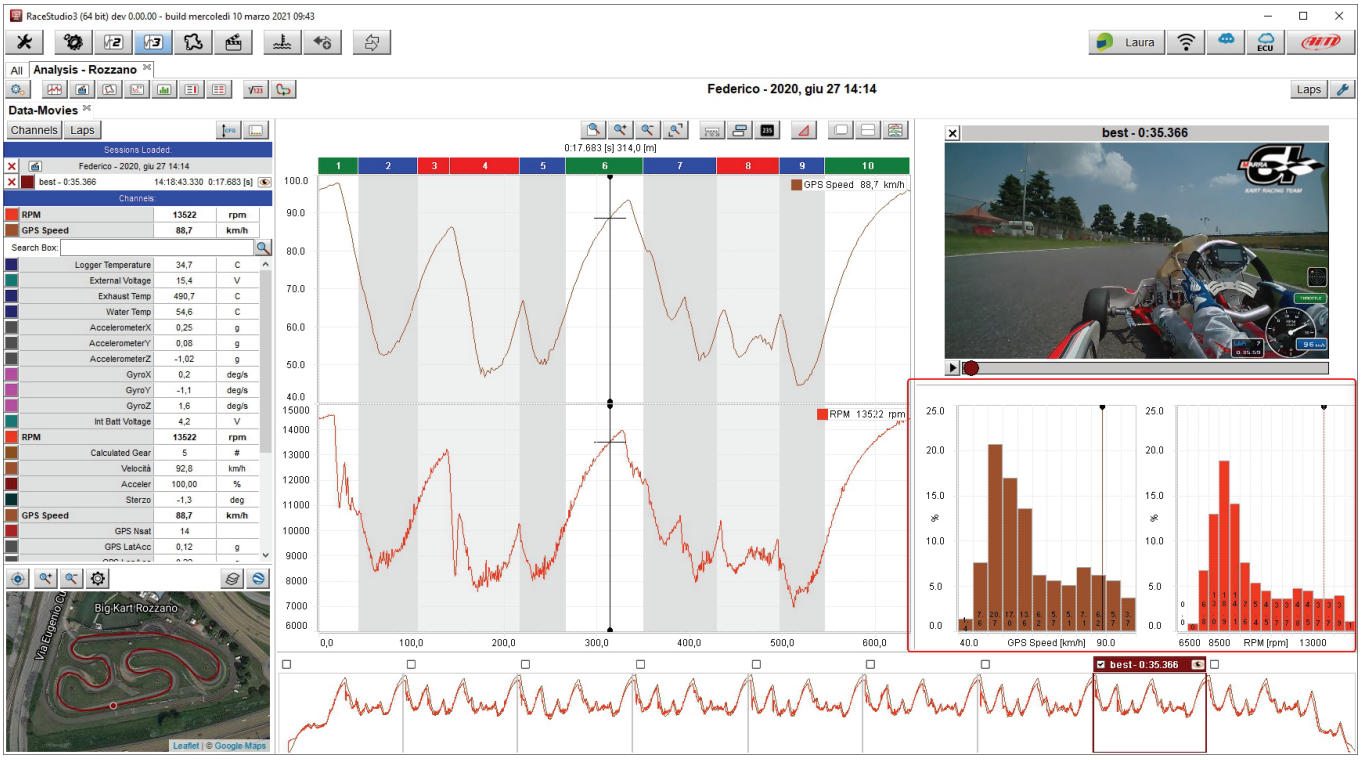
- right click on the window
- select “Add Window” option
- select the desired position (bottom in the example)



Choose the window to add in “Chose window type” dialog window (histogram in the example below)

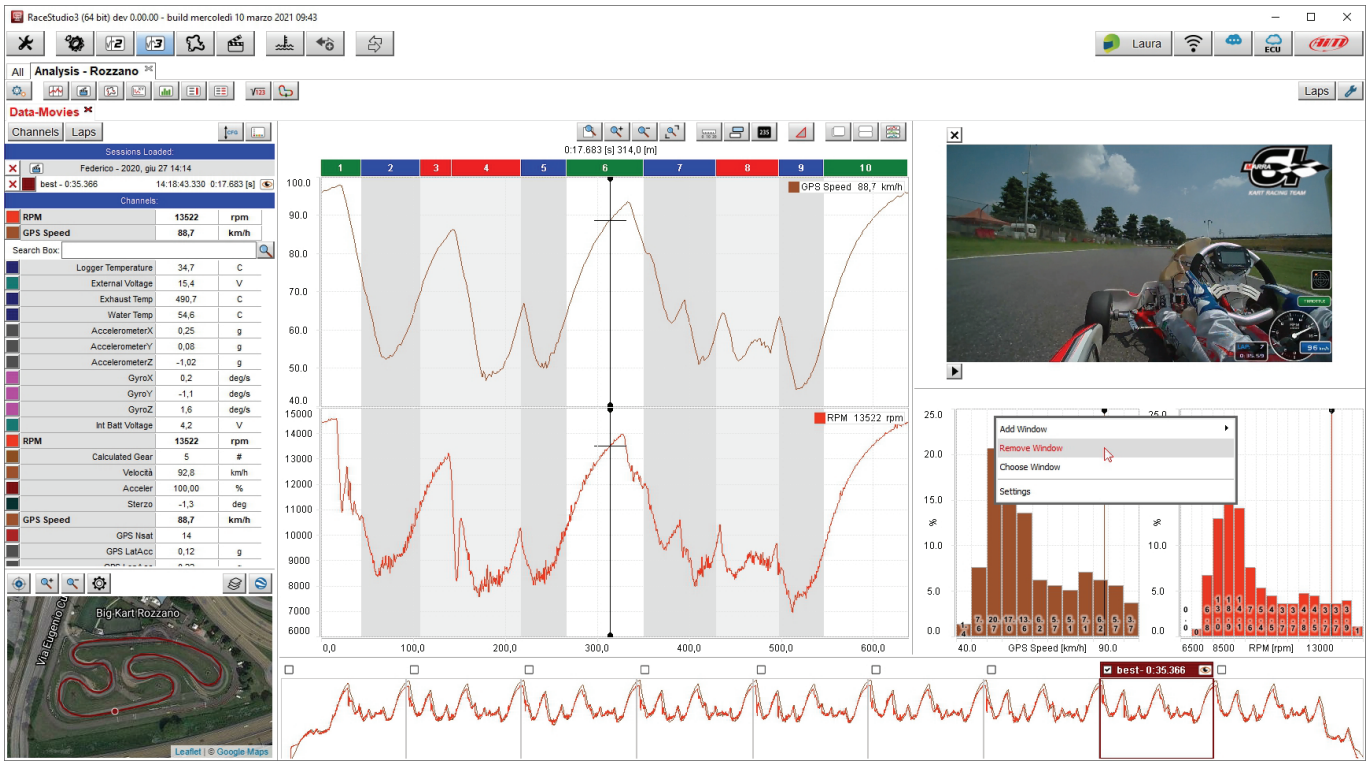
•

Press “OK” and the window is added.

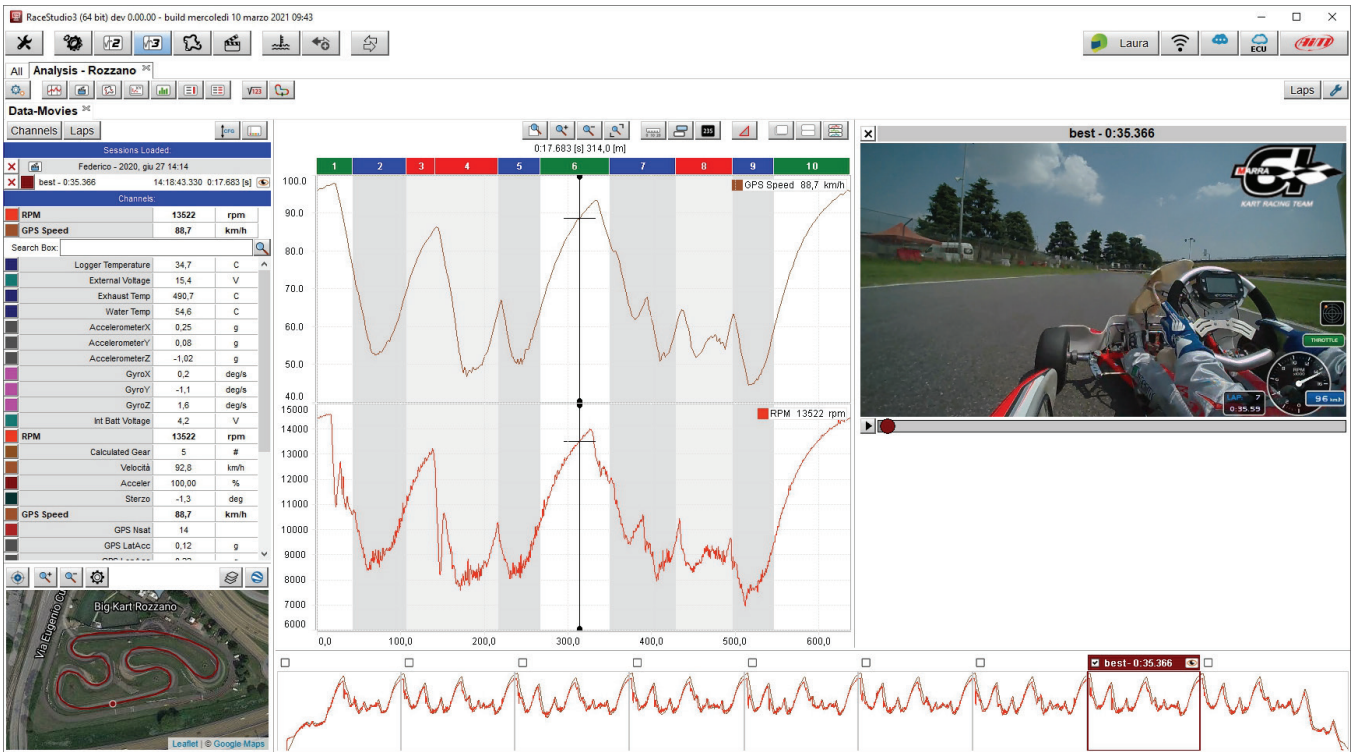


To **remove** a window place the mouse on the window to remove:

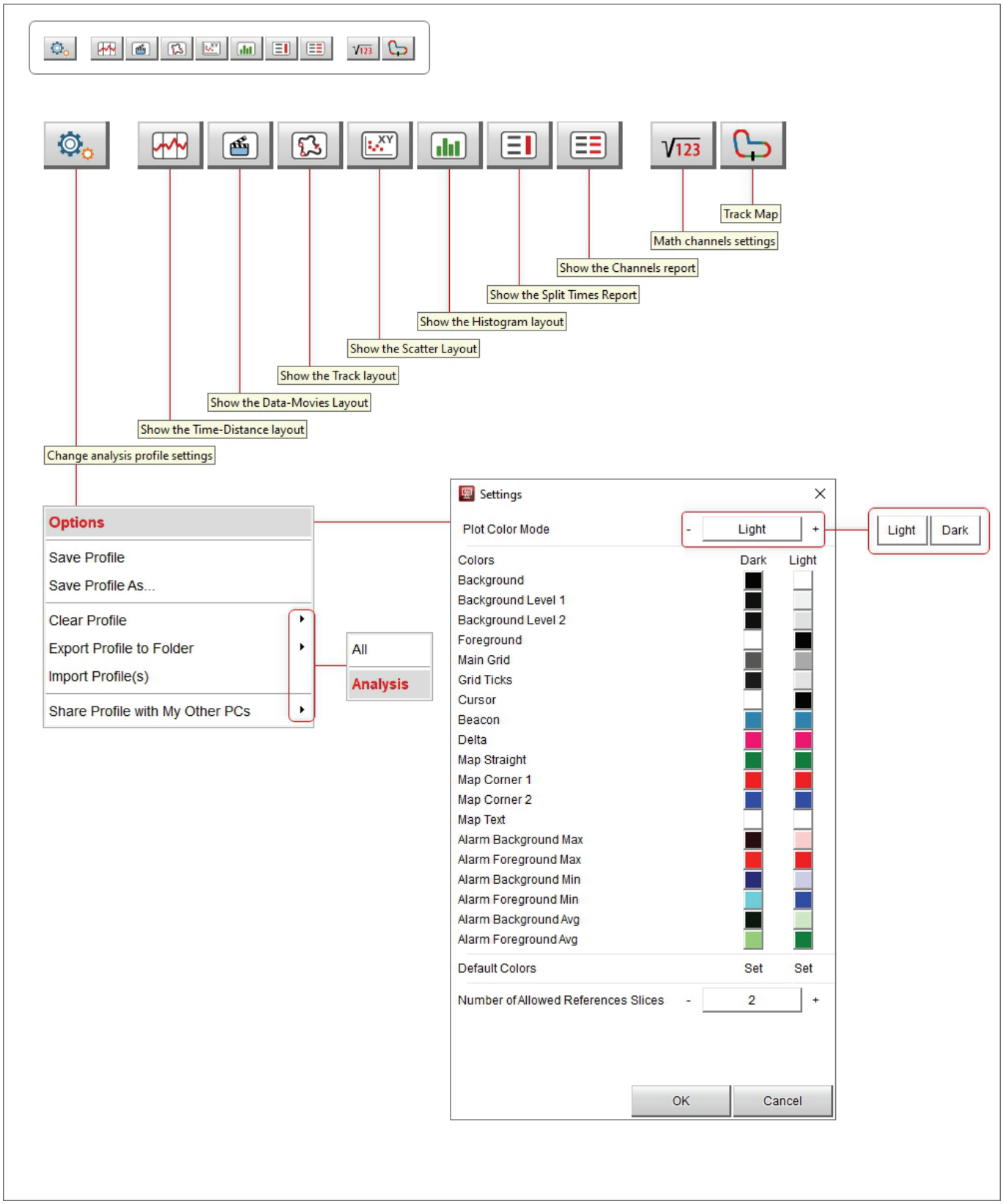
- right click on it and select “Remove Window” option



- the window is removed

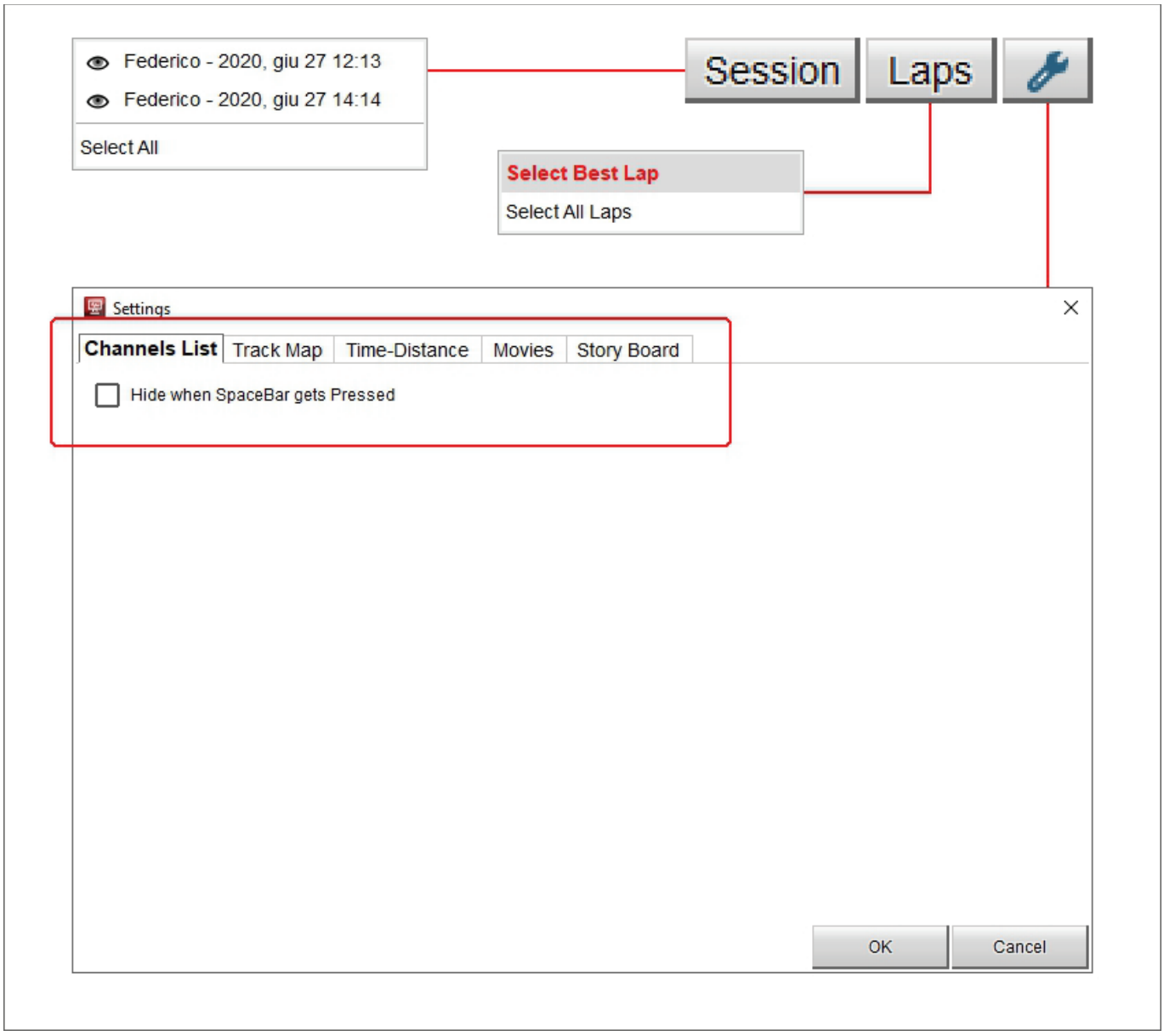


The analysis view can have different **layouts** according to the setting you choose on the top left keyboard.



Top right of the view is a steady keyboard that allows to:

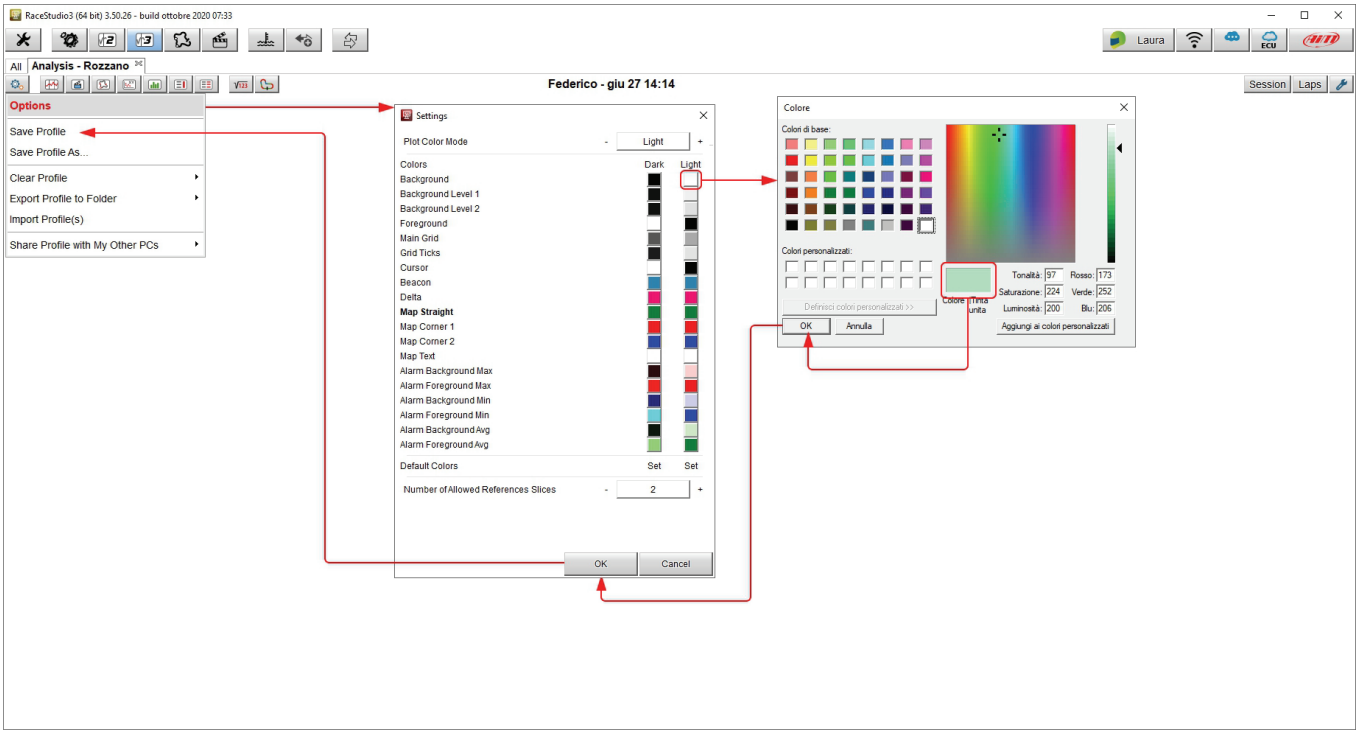
- Session: select one or all open session and appears only if more than one session is open
- Laps: select the laps to show in the selected layout:
    - Select best lap (default) only shows best lap in the selected layout
    - Select All laps shows all laps in the selected layout
- Plot settings recall the corresponding dialog window; if recalled from this keyboard it shows all layers related to the different parts of the view; each setting is explained in the related paragraph, to say:
    - Channels list: see paragraph 4.1
    - Track Map see paragraph 4.2
    - Time-Distance see paragraph 4.3.3
    - Movies: see paragraph 4.5
    - Story Board: see paragraph 4.6



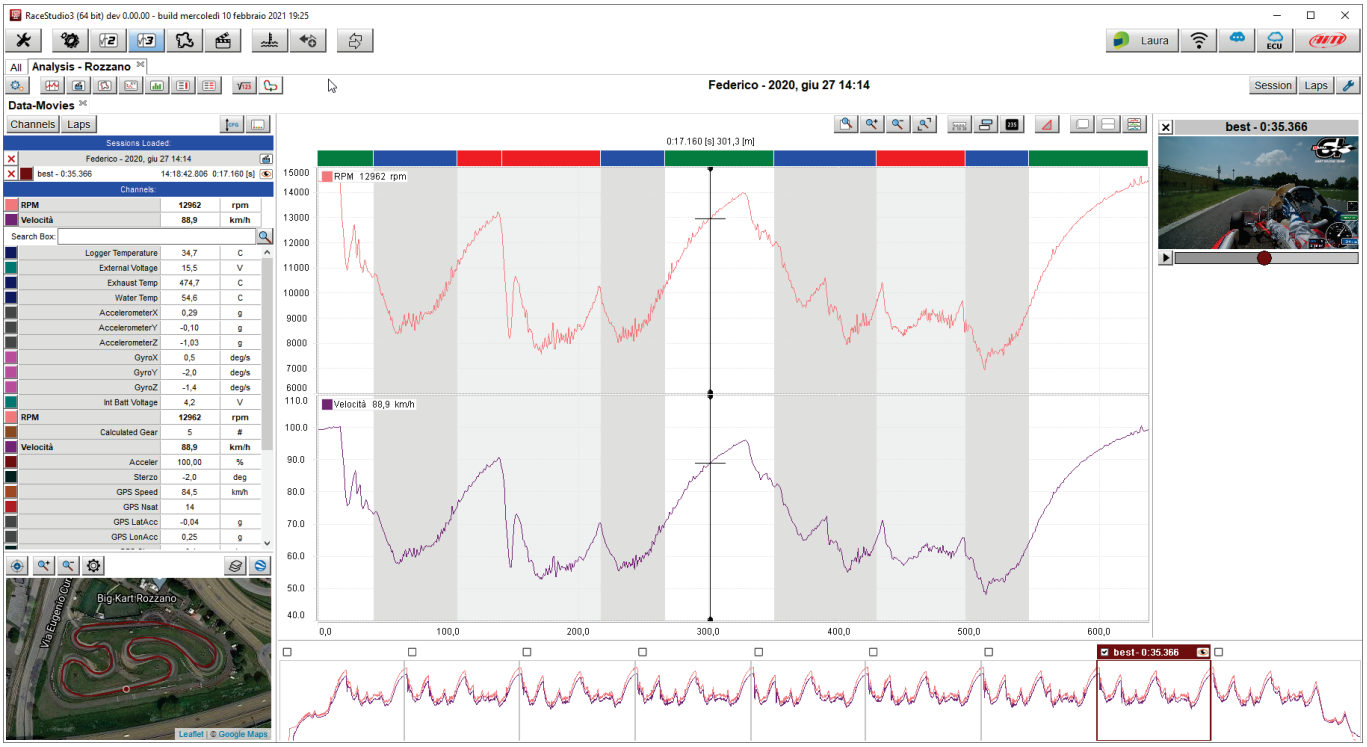
3.1 – View Options and Profiles

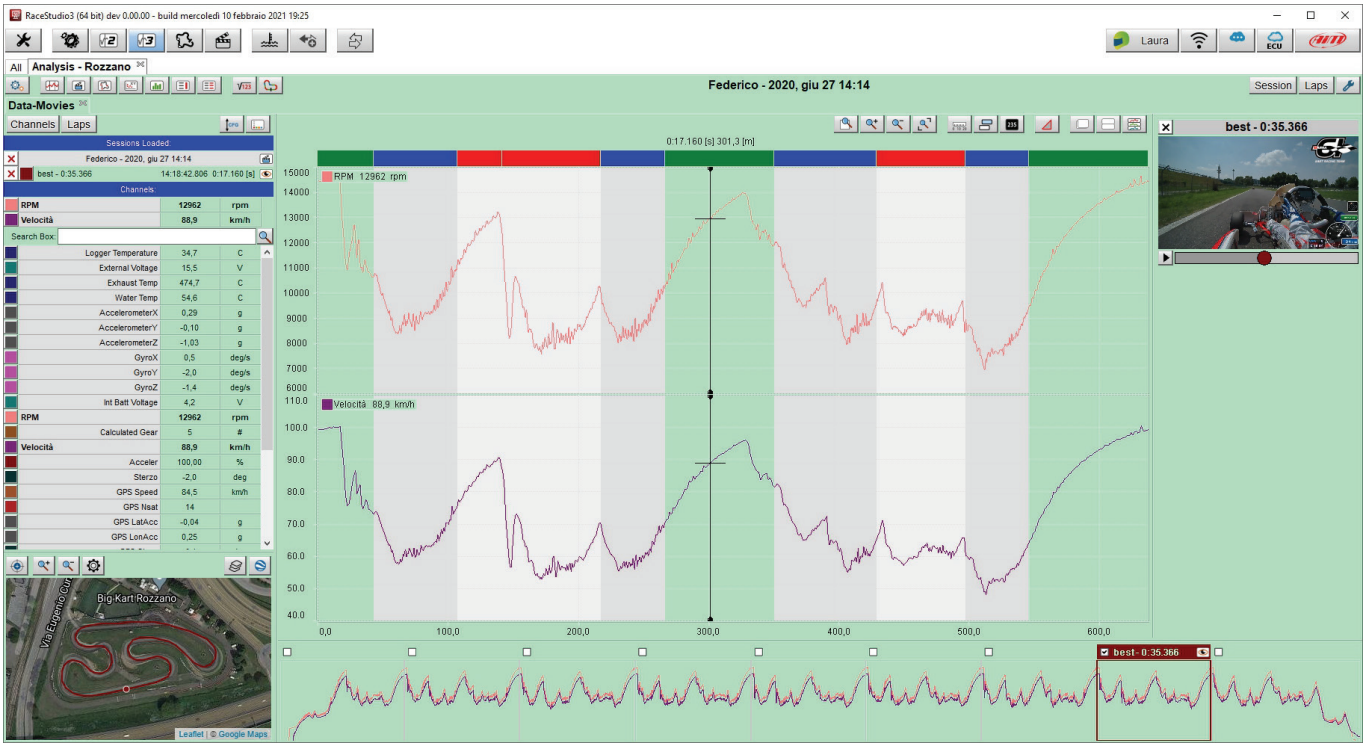
All Analysis views can have customized colours and these customizations can be saved in settings called “Profile”.
The easiest change you can perform to the view is changing the used colours:

- click the setting button shown above and select “Options”: a “Settings” dialog window is prompted
- to switch from Light to Dark plot mode press the related button;
- to change the colour of a single item in a colour plot mode, for example the background of “Light” plotting colour mode click on the related checkbox
- a colour palette appears on the right
- select the desired colour or move the pointer in the box right of the dialog window
- the result appears bottom of the nuanced palette
- press “OK” on both “colours” and “Settings” dialog window
- click again the setting icon top left of the view and select “Save Profile”
- from this moment the selected test will be shown with the new settings



The images here below show a view with default setting on top and a view with custom setting as explained bottom.

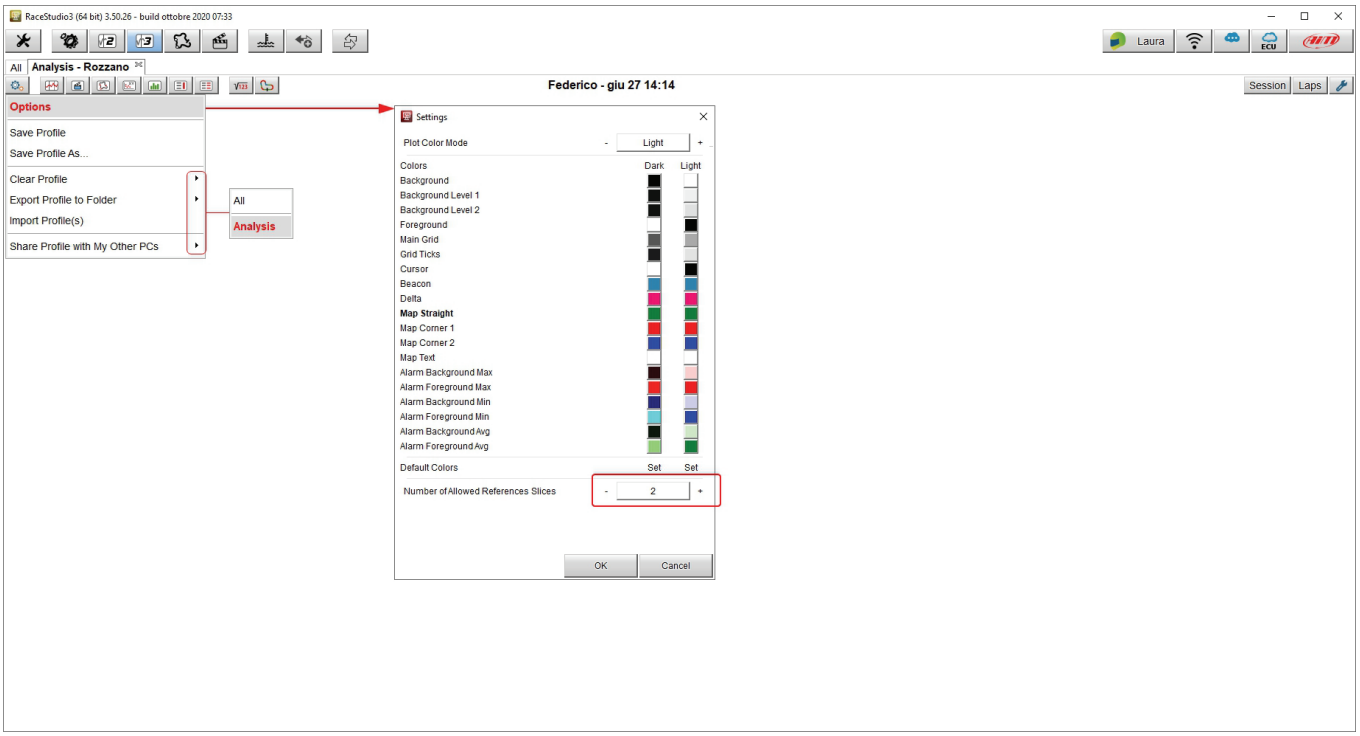




Profiles can be cleared, exported and shared one by one. “Analysis” is the default name of any profile; this means that as you save the profiles with names, “Analysis” option is replaced by a list and you can select the one to clear, export or share. Any operation can be performed on one only profile at a time.

Bottom of setting dialog window is a button that allows to decide how many reference laps can be shown for analysis in a view: available options are:

- 2 (default setting); this means that opening more than two laps channel tags (see paragraph 4.3.1) on the central graph and movies are shown only for two of them
- 4: channel tags in the central graph and movies are shown for four laps

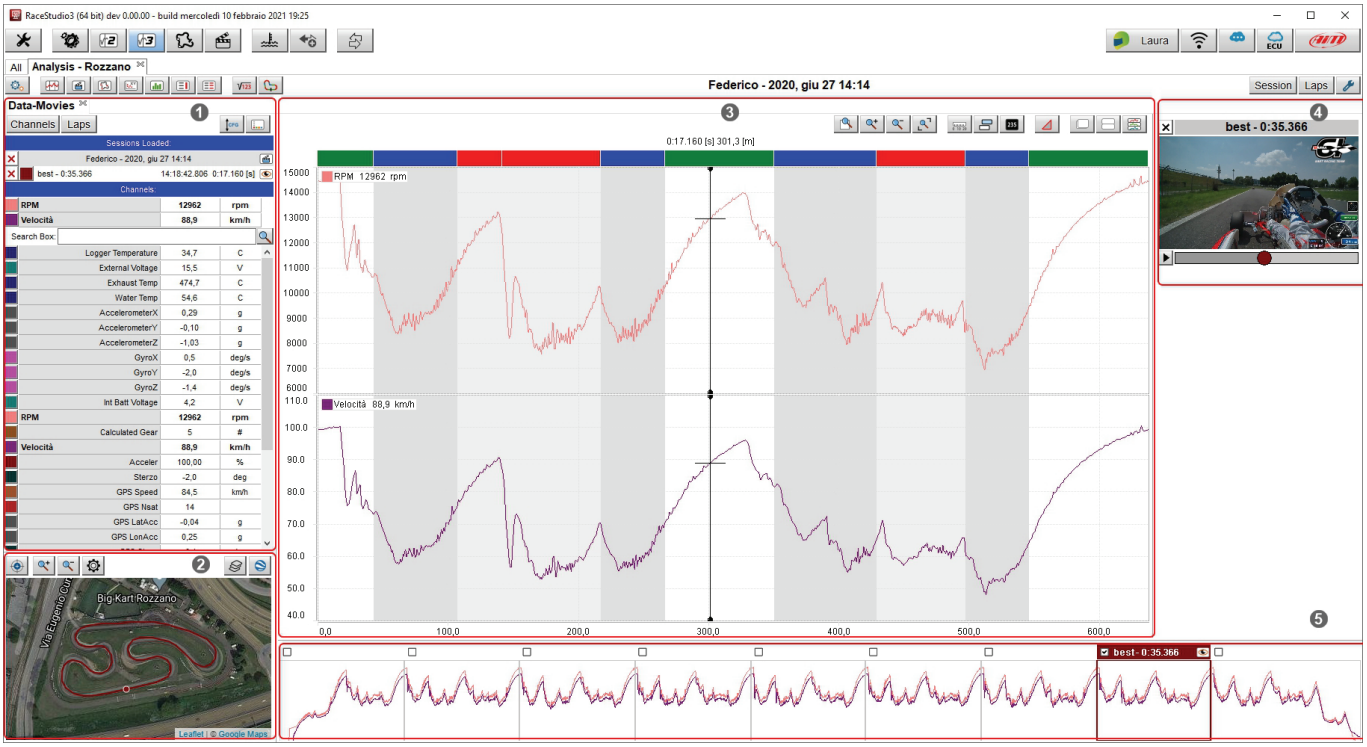


4 – Data-Movies layout

This layout is the default one if your data contain video and can be recalled pressing the button shown here above.
Being the most complete layout we will use it as reference for all dialog windows listed, exception done for the Graph dialog window (**3**) that changes according to the layout you select.
Movies layout shows:

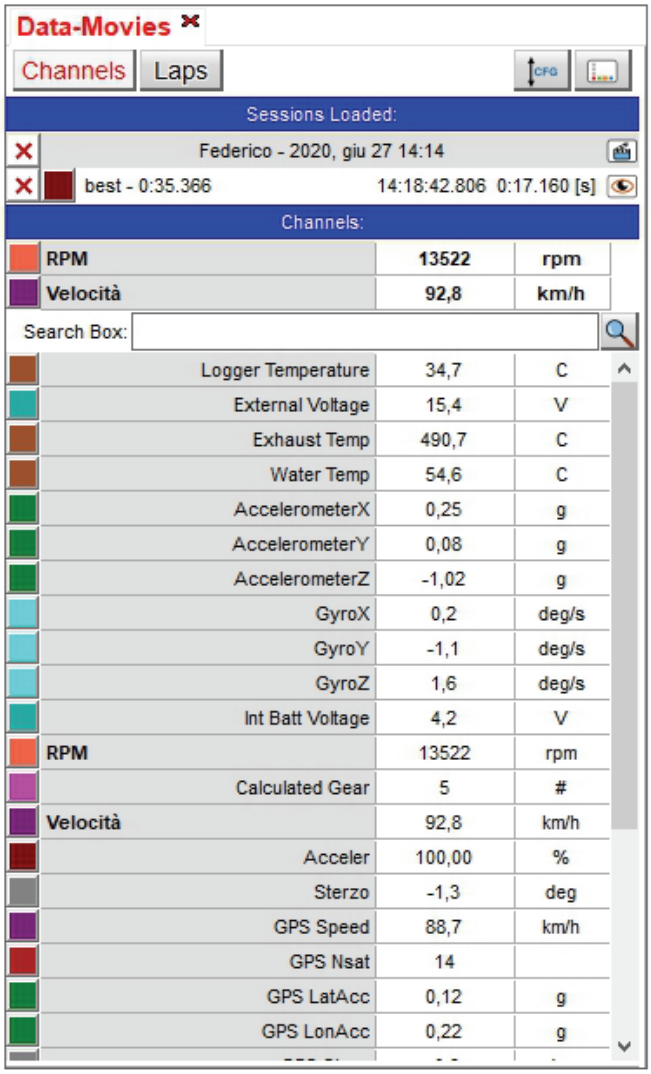
- Channels table (**1**)
- Track Map (**2**)
- Graph (**3**)
- Video (**4**)
- Storyboard (**5**)

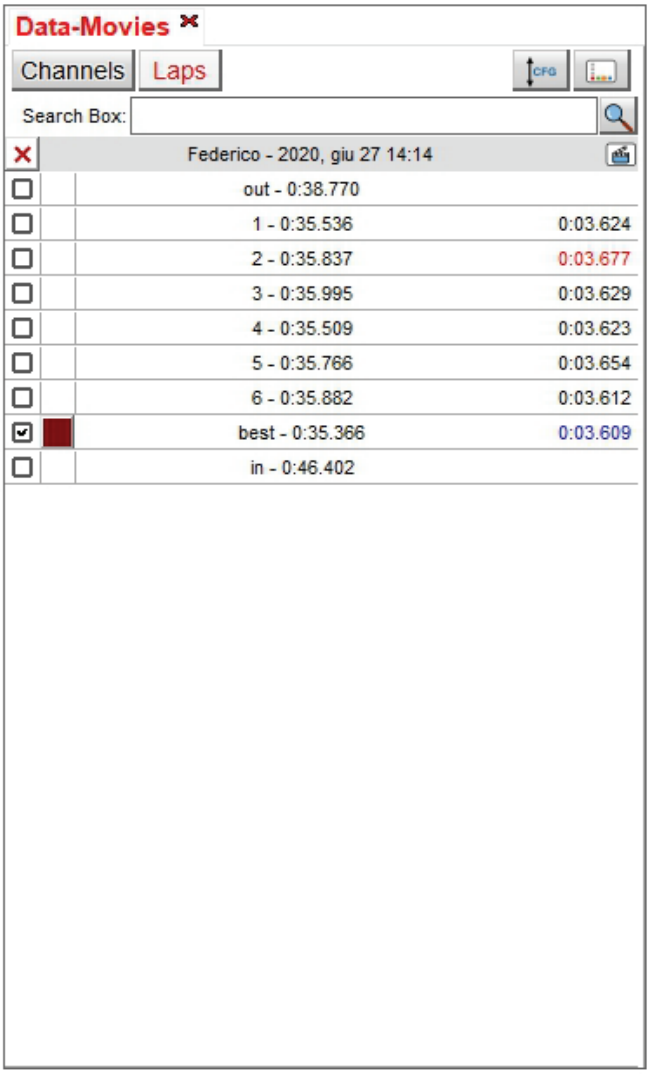
Each part of the layout is explained in the following paragraphs.



4.1 – Table of Channels and table of laps

Channels/laps table (**1** in the previous image) shows channels and laps data according to the button pressed on the top left keyboard as shown here below.





Channels view

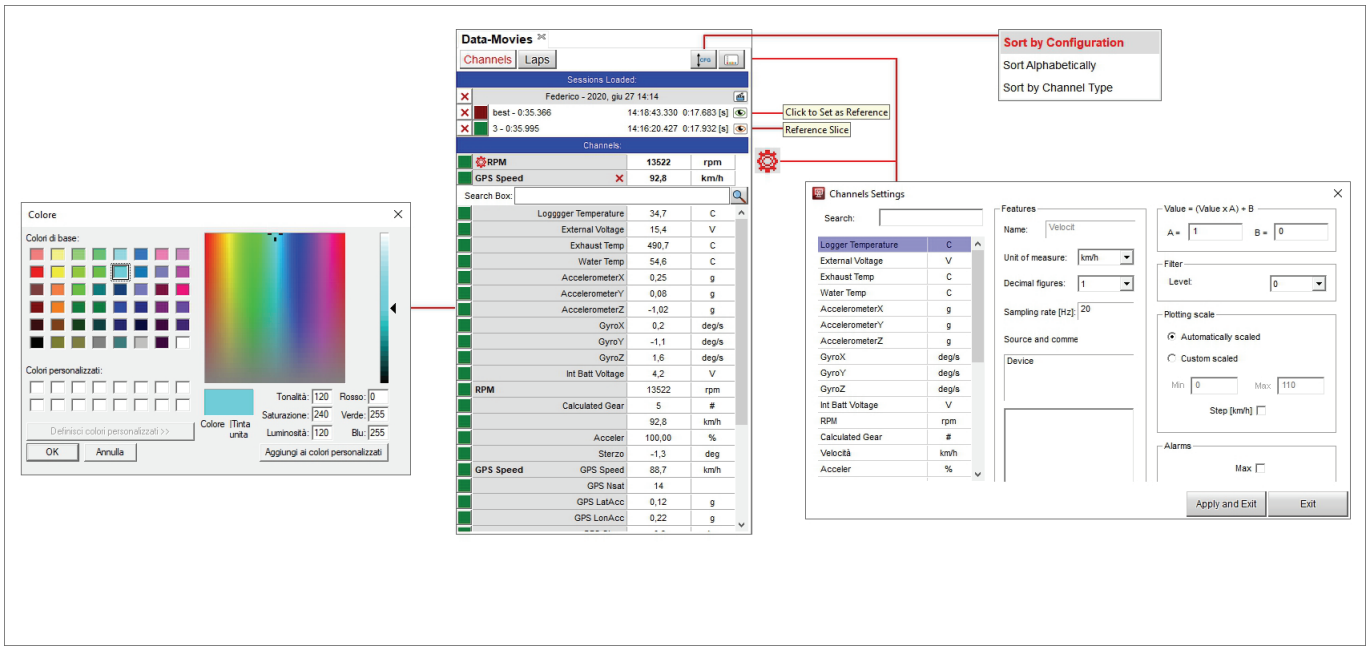
With reference to the image below, top right of the view is a **keyboard** that allows you to:

- change the order of the channels shown; they can be listed as managed by the firmware (sort by configuration), alphabetically or by channel type
- set the channels recalling the related dialog window

On top, under the label "**Sessions Loaded**" you see the sessions currently open.
Under the label "**Channels**" are the channels plotted in the central graph(by default RPM and speed), a search box (indicated by the magnifying lens) and bottom of it all the available channels.

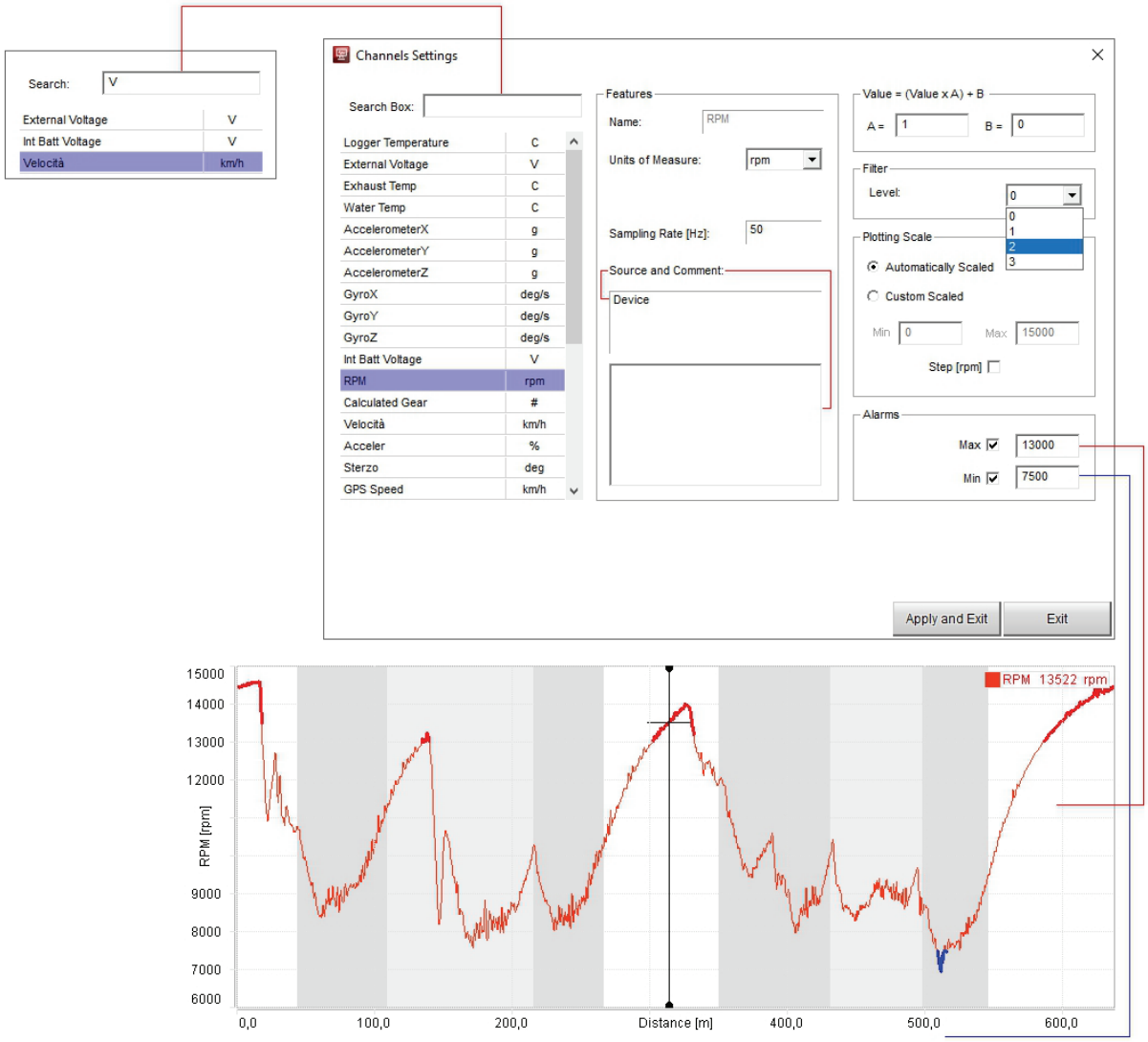
Mousing over any of the channel plotted in the graph a setting icon and a red cross appear in the corresponding box (channel RPM or GPS Speed in the example). The red cross is to delete the channel from the central graph while the setting icon allows to set it and recalls the related dialog window. The difference between this recall and the one performed pressing the top right keyboard is that in this case the channel you are setting is already selected.

Mousing over any of the channels not plotted in the central graph only the setting icon appears.



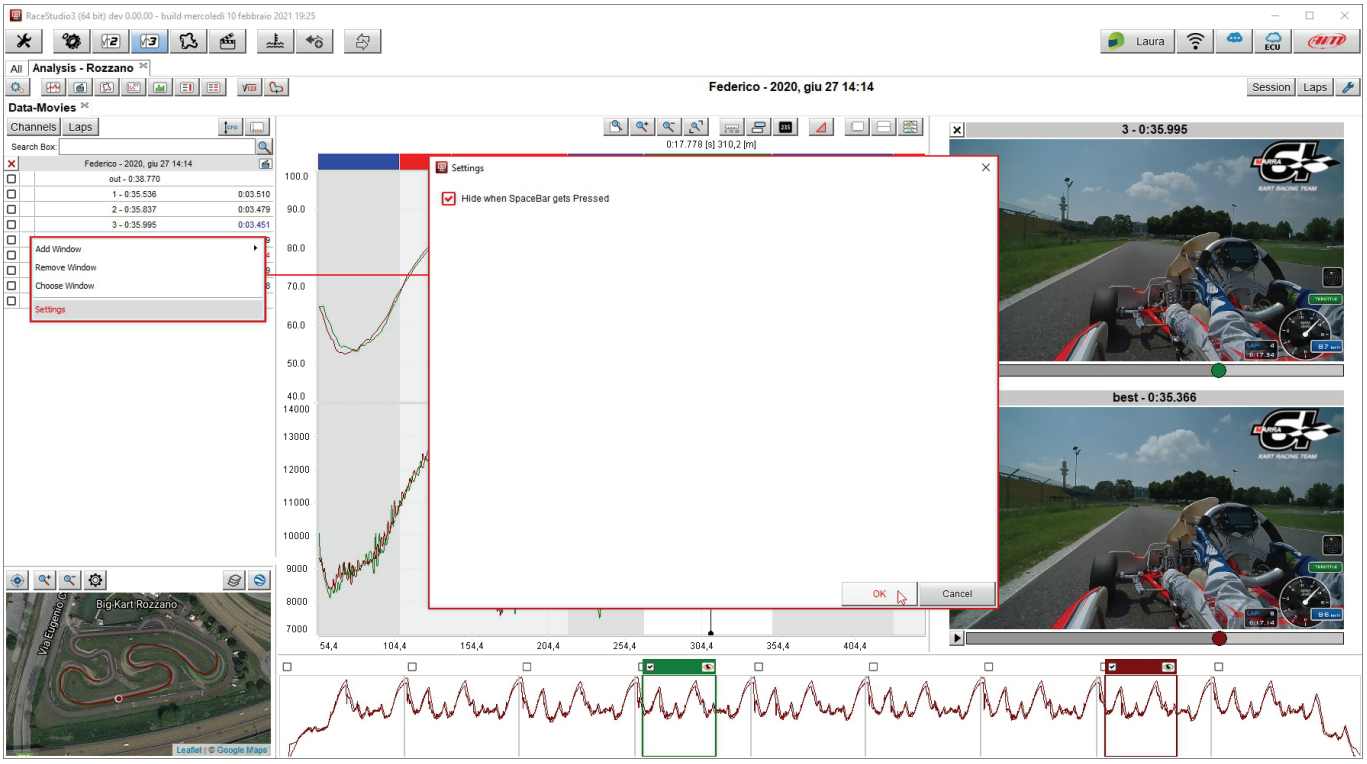
The setting dialog window allows to perform a lot of operations:

- typing in “Search” box the channel you are looking for, the system makes an automatic selection
- you can change the unit of measure and the sampling frequency
- the source of your data is specified
- you can insert a comment about the data
- in “Value” box you can correct a channel that has been wrongly set and cannot be reset
- you can filter the noises using different levels of filter
- the plotting scale of the central graph can be: automatically o custom; in this second case a range of values is needed
- Alarms allows to set an alarm for max and min values of the channel; these values are shown bold in central graph and in all the laps shown int the storyboard bottom of the page.

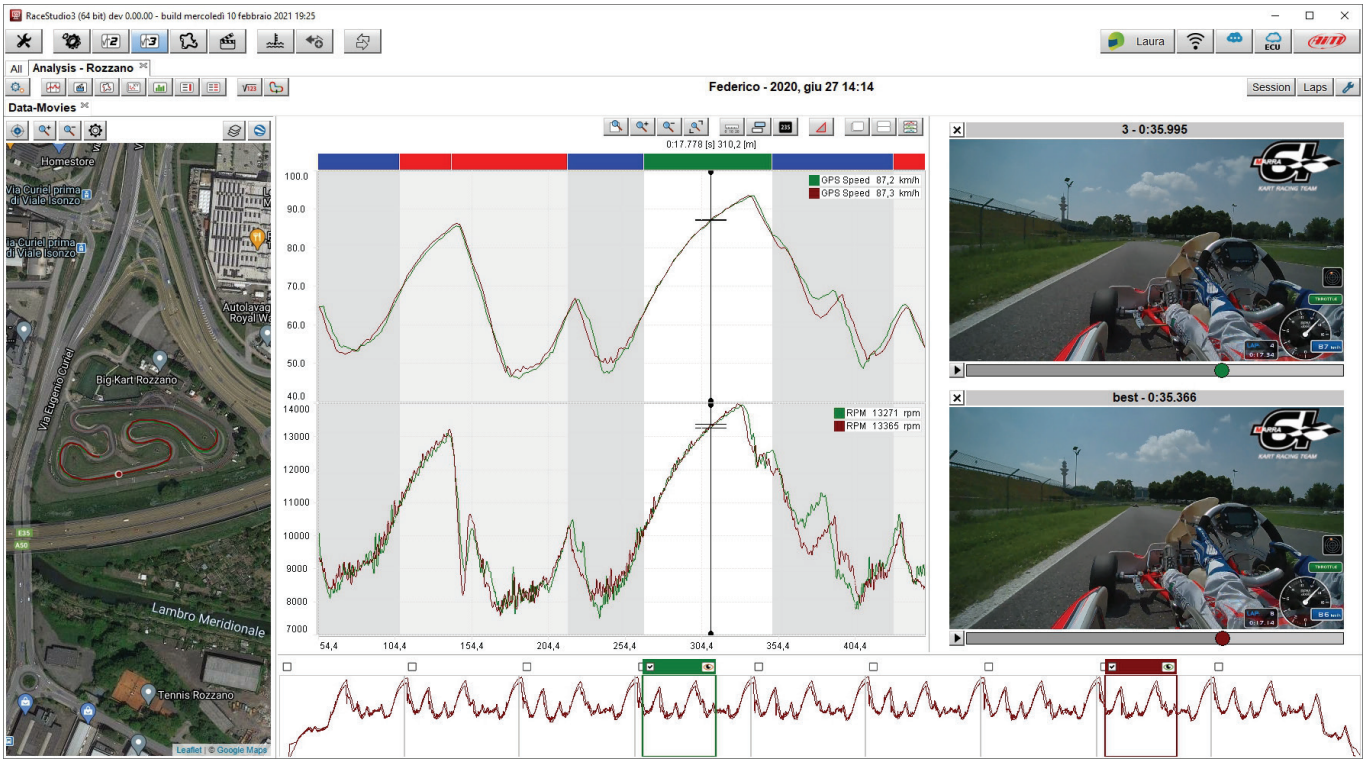


The **Laps table** shows all laps of the session with the best indicated.
Channels/Laps table can be hidden pressing the space bar through setting dialog window. To enable this setting:

- right click on the channels table
- select “Settings” option
- enable the checkbox “Hide when Space Bar gets pressed” on the dialog window that appears
- press “OK”



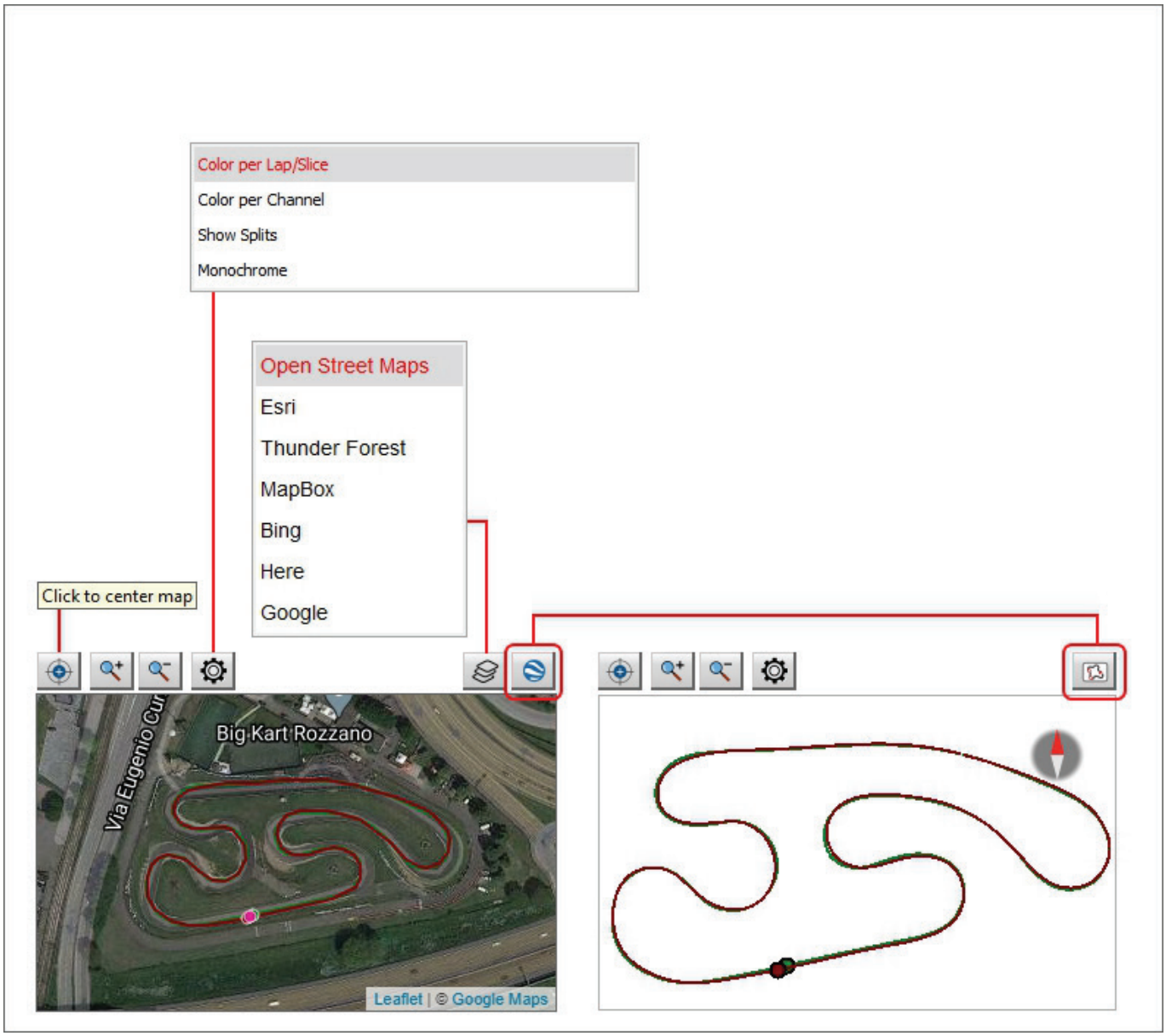
Once the setting fixed, channels table disappears when the space bar is pressed (image below) and re-appears when you press it again.



4.2 – The track view

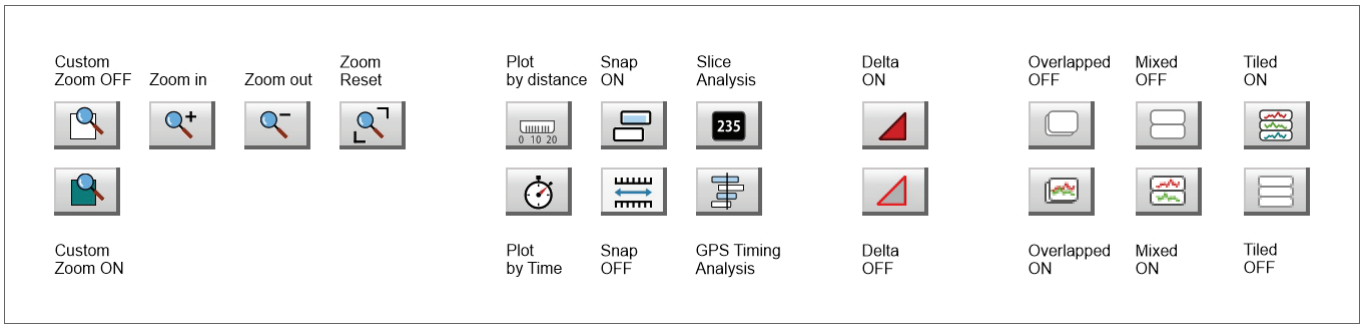
Immediately below the channels table is the track Map view. You can zoom in/out the map as well as center it.
Using the setting icon it is possible to decide how to colour the track map while with the tiled icon the desired tile provider can be chosen among these available at present.

The map can be shown as earth view or as track map using the icon top right of the dialog window. Switching from one view to the other the icon changes too.



4.3 – The time/distance view

Central in the page of the software is a graph. It can be shown differently according to the setting you select in the top keyboard. The image here below shows its buttons;: buttons placed one above the other are switching buttons.



Here follow a short explanation of the different options activated by the buttons; options that will be shown in the following pages.
Zoom:

- Custom zoom ON: dragging and dropping the graph cursor you define the time period/run distance to zoom
- The other icons allows to zoom in/out the graph and reset the zoom

Plot:

- by distance: you have run distance on the abscissa axis and RPM value on the ordinate axis
- by time: you have run time on the abscissa axis and RPM on the ordinate axis

Snap:

- ON: the graph can show only part of the graph included in a complete laps
- OFF: the graph can show also part of the graph belonging to different but following laps

Slice/GPS Timing (useful to show different pilots in the same race):

- Slice Analysis Mode: allows only "Time" on the abscissa axis; shows the selected time period in the storyboard and can be modified using the mouse wheel
- GPS timing analysis mode: allows both time and distance on the abscissa axis; shows the selected time period in the storyboard and can be modified using the mouse wheel

Delta ON: dragging and dropping the graph cursor the calculated time period/run distance is shown top left of the graph

Overlapped ON: all shown channels are shown in the same graph

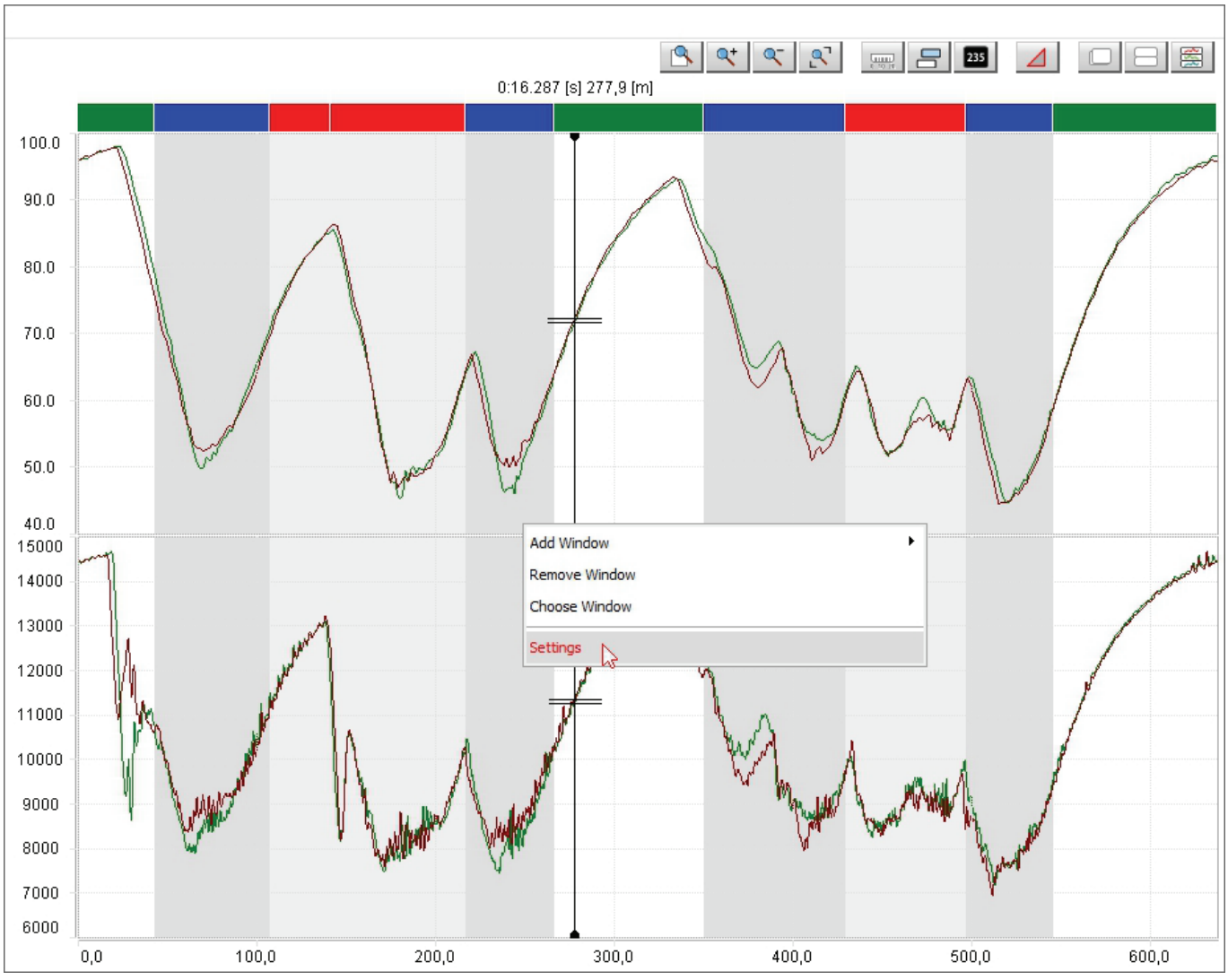
Mixed ON: you can decide which channel to show in which graph; a numbered box appears left of each shown channel in the channels table: clicking it you can decide in which graph to show that channel; max allowed number of graphs is 6

Tiled ON: each channel has its own graph

4.3.1 – The graph settings

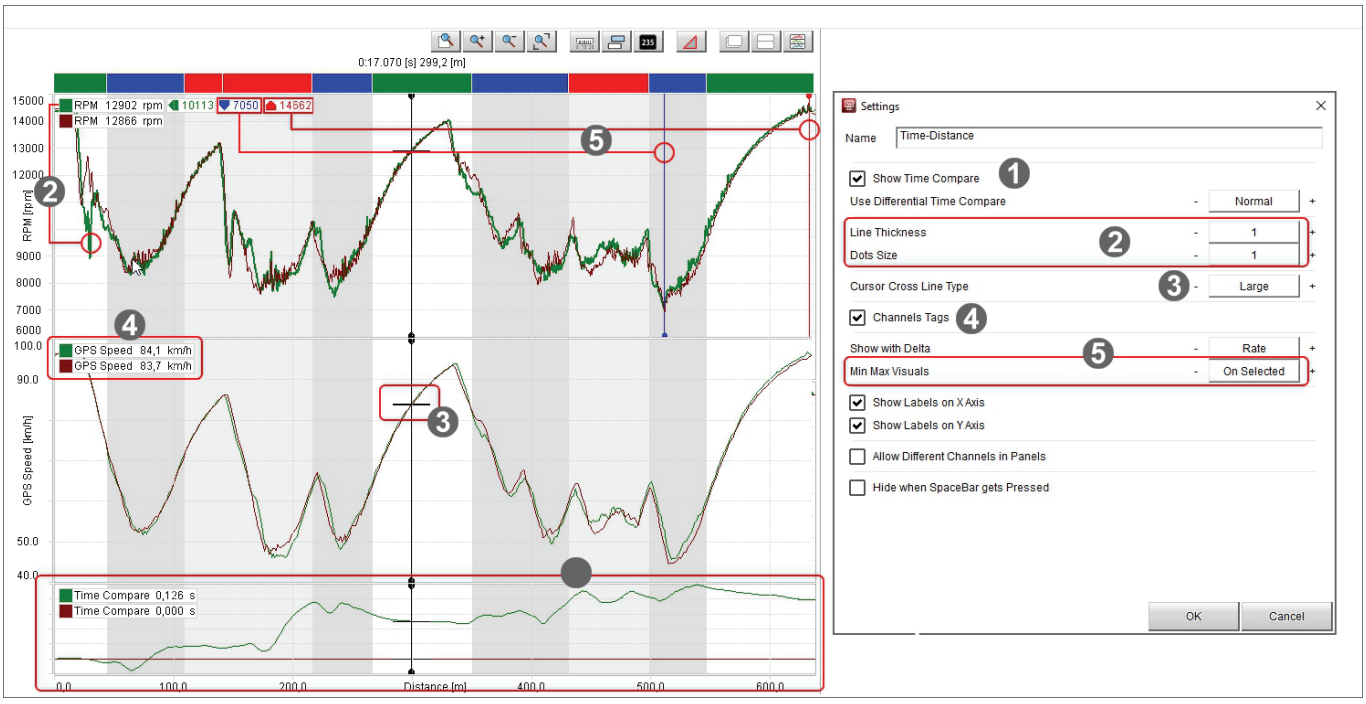
The graph layout can be customized using the proper setting dialog window. To do so:

- place the mouse on the graph
- right click on it
- select “Settings”



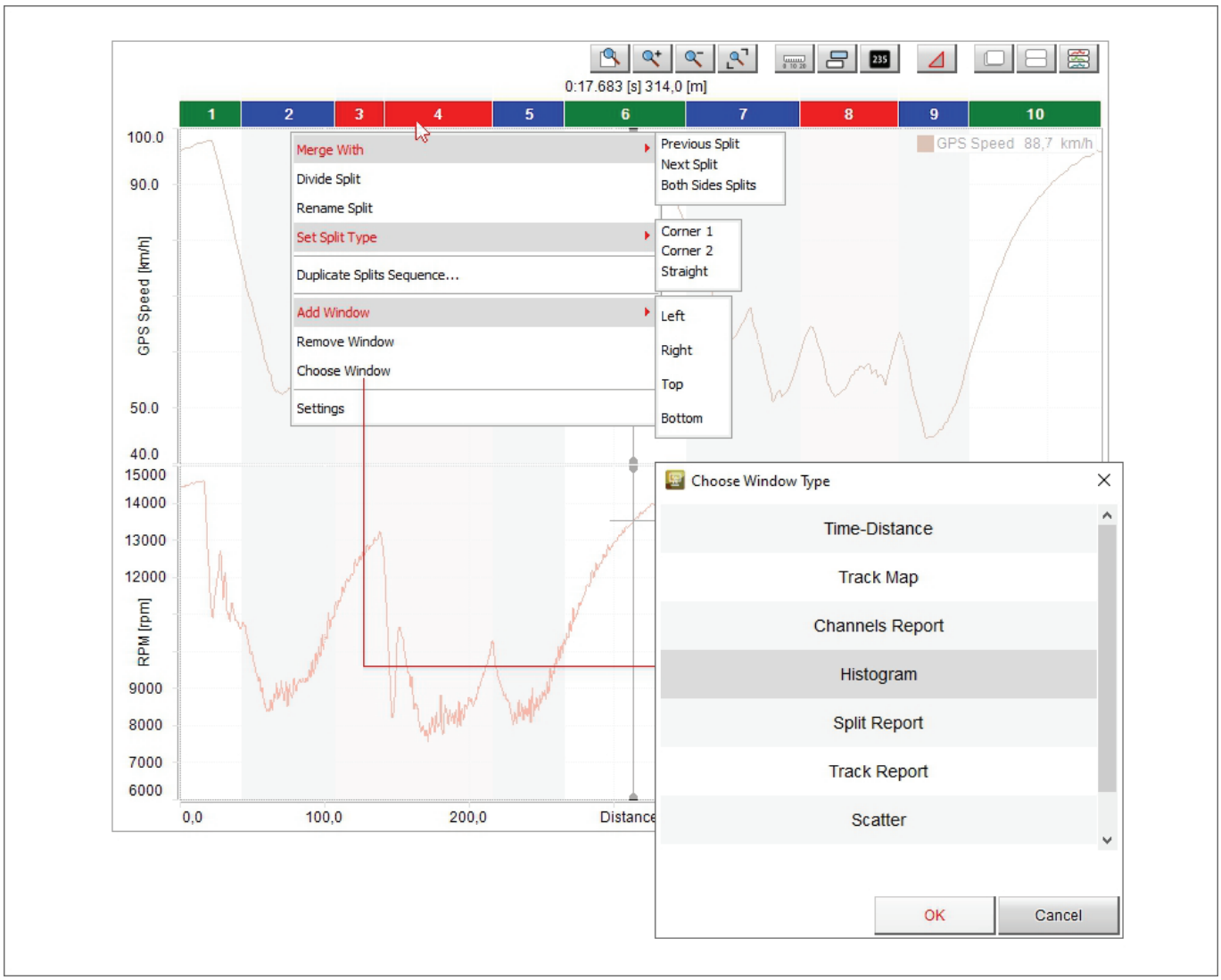
With reference to the image below, "settings" dialog window allows different layout options:

- **Show/Hide "Time compare" graph** (**1**): assumed that you are in "distance" mode (see paragraph 4.3) and more laps are selected a "Time compare" graph is available bottom of all graphs and can use normal or differential setting
- The graph lines can have different **Thickness/Dots size** (**2**)
- Change **Cursor Cross Line Type** thickness (**3**); available options are:
    - None (no cursor is shown)
    - Small
    - Large
    - Full in (the image below)
- The values of the channels plotted in the graph can be shown in dedicated boxes called **"Channels tags"** enabling the corresponding checkbox; clicking the channel tag the line of the channel whose tags has been pressed becomes thicker (**2**)
- When in **"Delta"** mode (see paragraph 4.3.7) data can be shown in different ways:
    - Rate: channel increasing rate
    - Average: channel average increasing rate
    - Average not zero: channel average increasing rate excluding when the channel value is zero
    - Only delta: the graph only shows the delta value
- **Min/Max** values tags are three boxes that shows min/max and average value of the channel; the point where the min/max value has been sampled can be indicated by a proper line (**5**) available options are:
    - always: they are always shown
    - on selected: they appear only selecting the channel tag
    - disabled: they are never shown
- Show/Hide axis **Labels**
- **Allow different channels in Panels** (see paragraph 4.3.2)
- **Hide** the graph **when the spacebar gets pressed** (see paragraph 4.1)



In time/distance plotting (paragraph 4.3.3) all graph splits are identified by a coloured bar top of the graph.
Clicking on a split the graph resizes at that split level and clicking again the top bar the graph shows again all splits. Different operations can be performed on the splits.

- Merge more splits. Each split can be merged:
  - with previous split
  - with next split
  - with both sides split
- Set split type as:
  - corner 1
  - corner 2
  - straight
- Add window):
  - left
  - right
  - top
  - bottom
- Change the graph with “Choose window” dialog window:
  - choose the graph (histogram in the example) and press ”OK”: the graph will be substituted

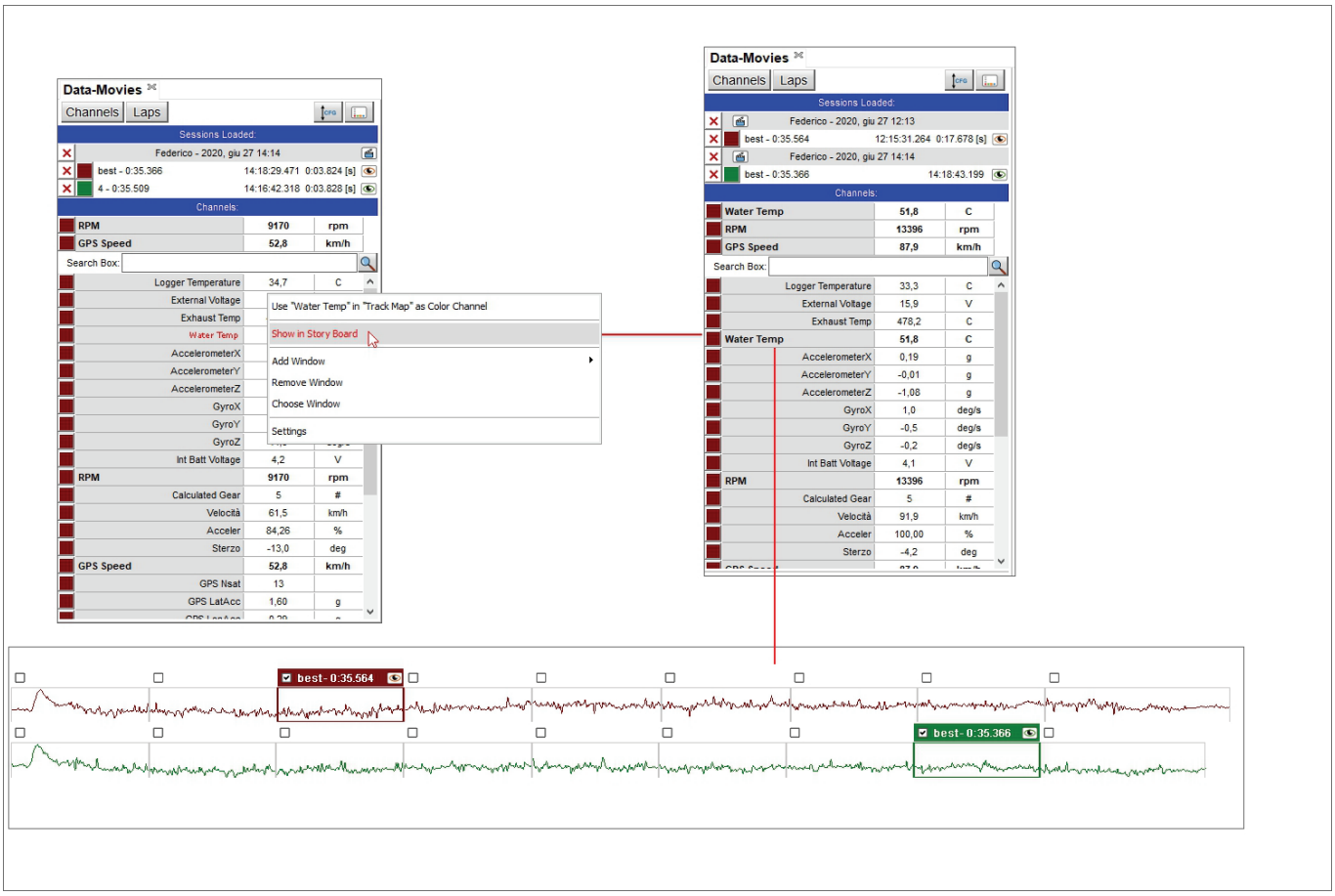


4.3.2 – Allow different Channel in panels setting (graph and storyboard view only)

The channels shown in the central graph and in the storyboard can be changed enabling the related checkbox in “Setting” dialog window. To show, for example, RPM and speed in the central graph and water temperature in the storyboard follow these instructions:

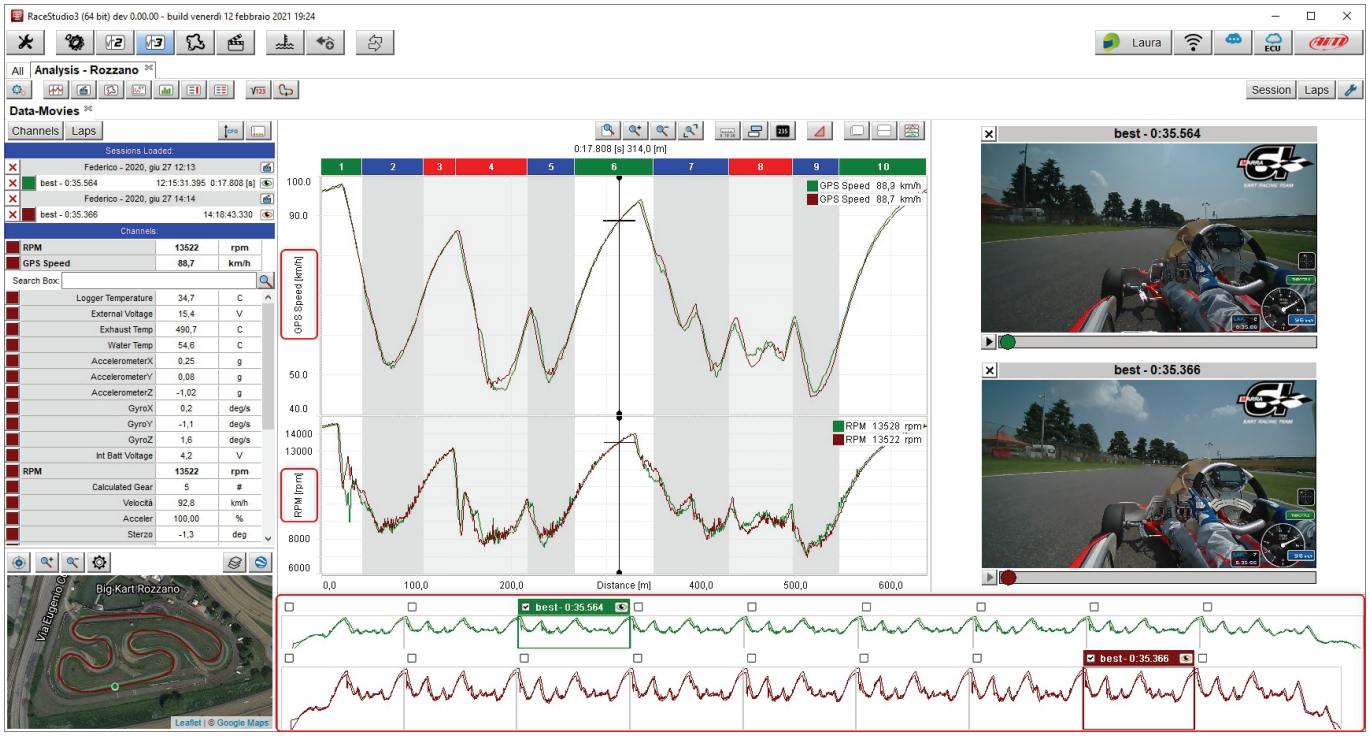
- place the mouse on the storyboard
- right click and select “Settings” options
- enable “allow different channels in panel” checkbox
- press “OK”

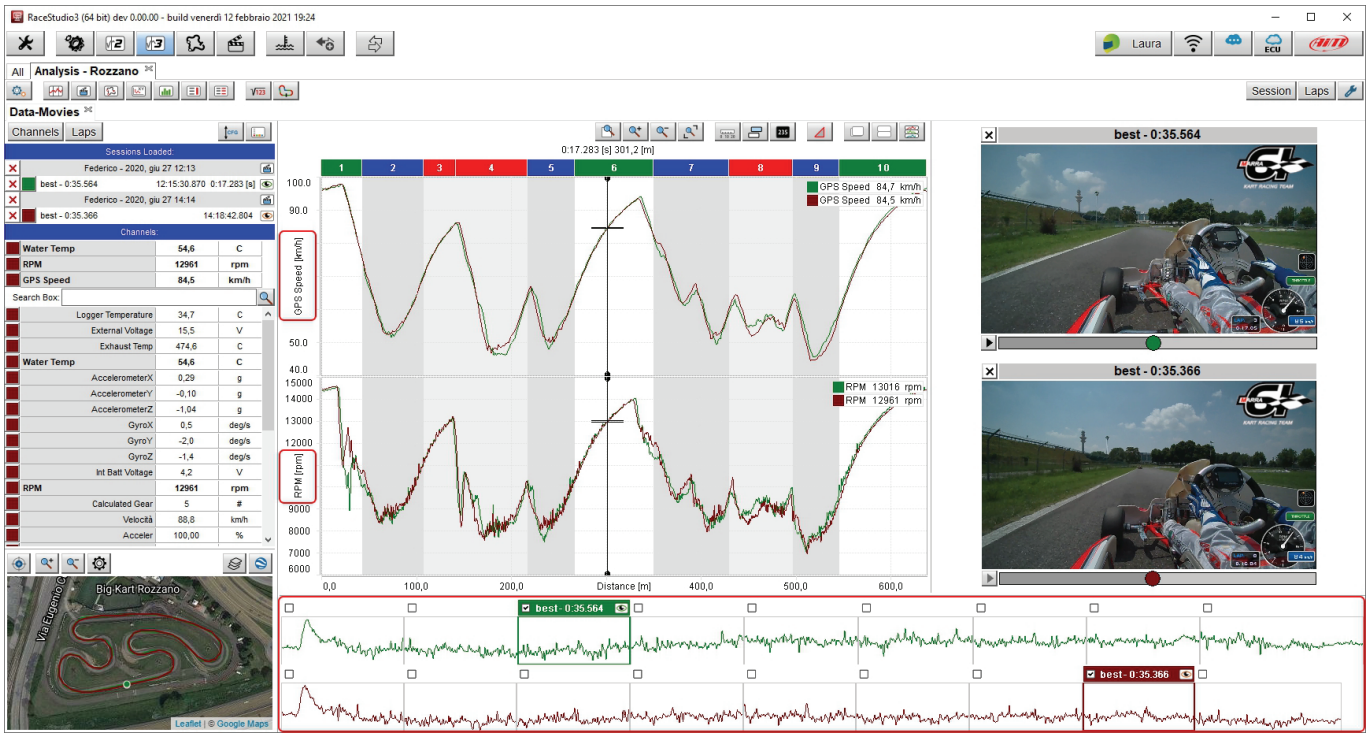
- go in channels table and right click on “Water temperature” channel
- select the option “Show in storyboard”



The images below show: on top the default view and bottom the view allowing different channels on the panels.
In the default view you see RPM and GPS speed both in the central graph and in the storyboard; each session is identified by a colour and you see two lines in the graphs of the storyboard.

Allowing different channels on panels you see RPM and GPS Speed in the central graph and water temperature in the storyboard graphs (one line only).



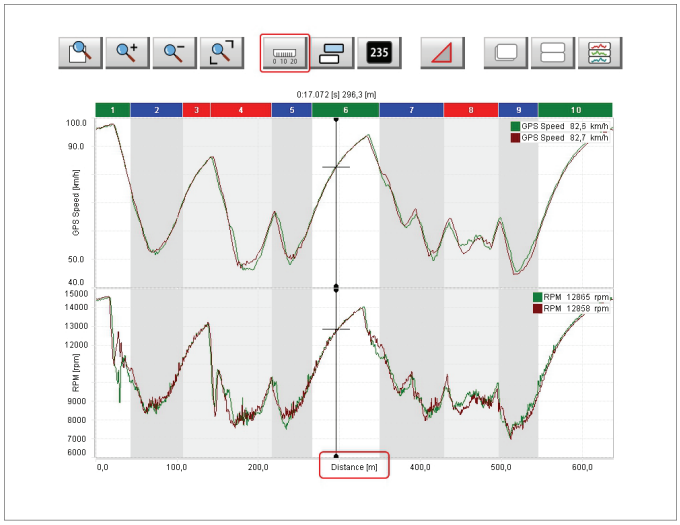


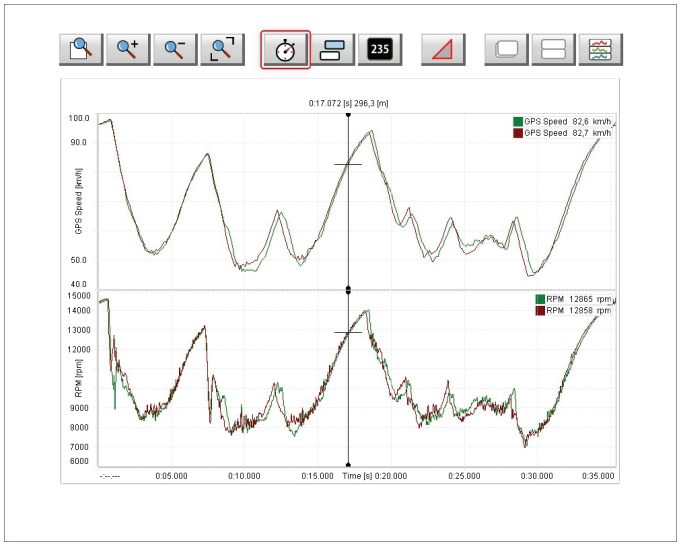
4.3.3 – Plotting the graph by Time/Distance

As shown here below, the main difference among the graphs is the channel plot on the abscissa axis:

- Distance plotting is shown here below on the left
- Time plotting is shown here below on the right.

In distance plotting the splits are identified by coloured bands top of the graph. The graph can be zoomed at a split level double clicking on the desired split.
To come back to standard zoom double click on the split band or press the proper button (see paragraph 4.3).
The graph can also be zoomed in/out with the mouse wheel.





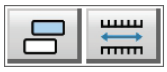
If more laps are open for analysis each one is indicated by an icon according to its status. In the image below the icons are shown centrally:

- Reference lap (top icon): is the one used in time compare graph (see image in the following page)
- Lap loaded with video and map (central icon)
- Lap loaded but without video nor track map (bottom icon); this happens if more than two laps (reference slices) are loaded with default settings and if more than 4 laps (reference slices) are loaded with custom settings (see paragraph 3.1 for further information)

"Time Compare" graph appears bottom of the graph view if enabled in the setting dialog window (see paragraph 4.3.1)

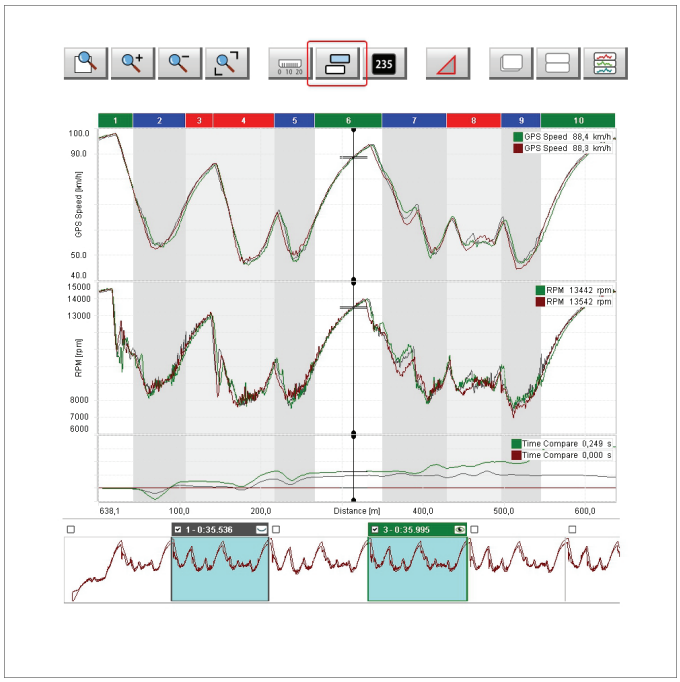
- Using a lap as reference lap ( ) it shows in a graph the time differences among the reference lap and the other loaded laps.

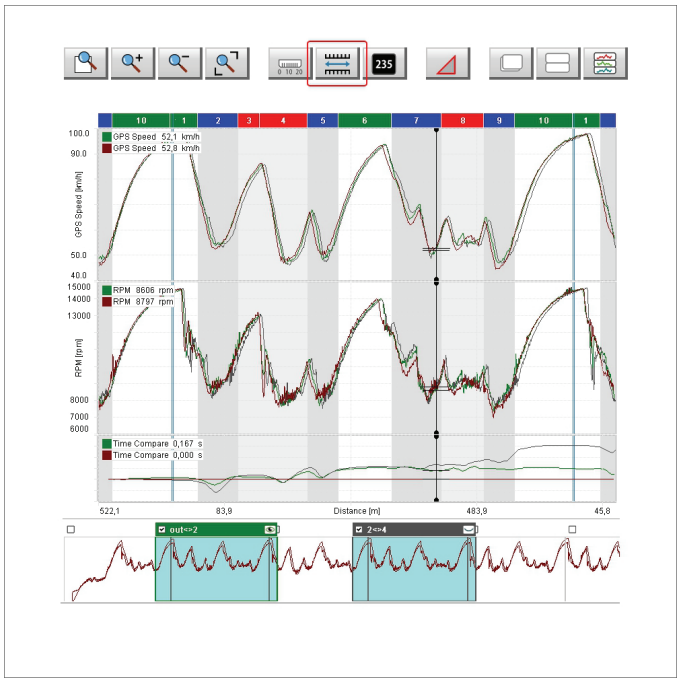
4.3.4 – Graph Snap ON/OFF mode



As shown here below:

- with snap on (left image) the max part of race you can see on the abscissa axis of the graph is an entire lap; the graph can be zoomed in/out using the mouse wheel but zoom out cannot exceed an entire lap; as for plot by distance, snap on shows the lap splits top of the graph
- with snap OFF (right image) the part of the race you can see on the abscissa axis is bigger than an entire lap; the graph can be zoomed in/out with the mouse wheel and zoom out can reach the entire session.

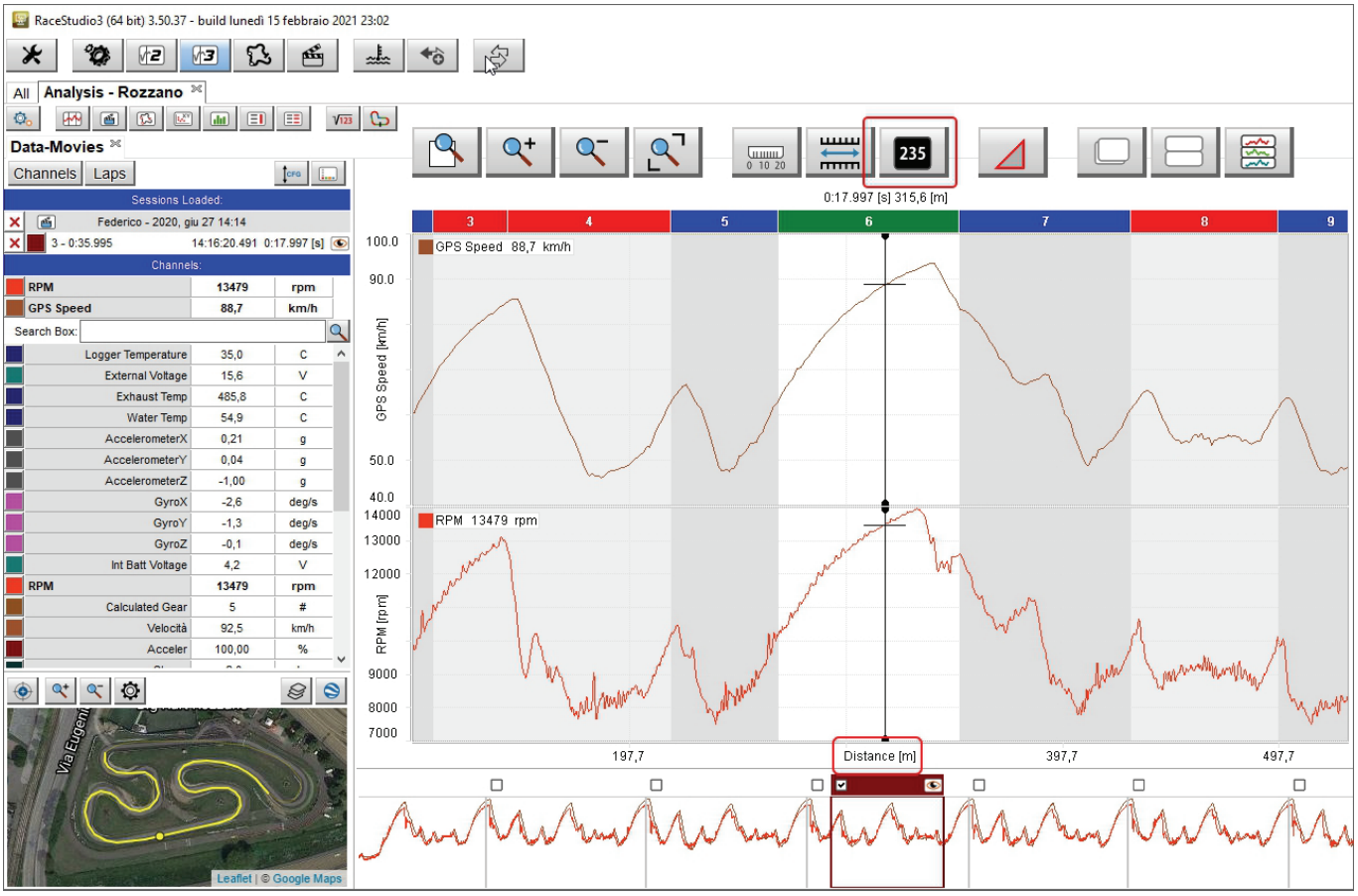




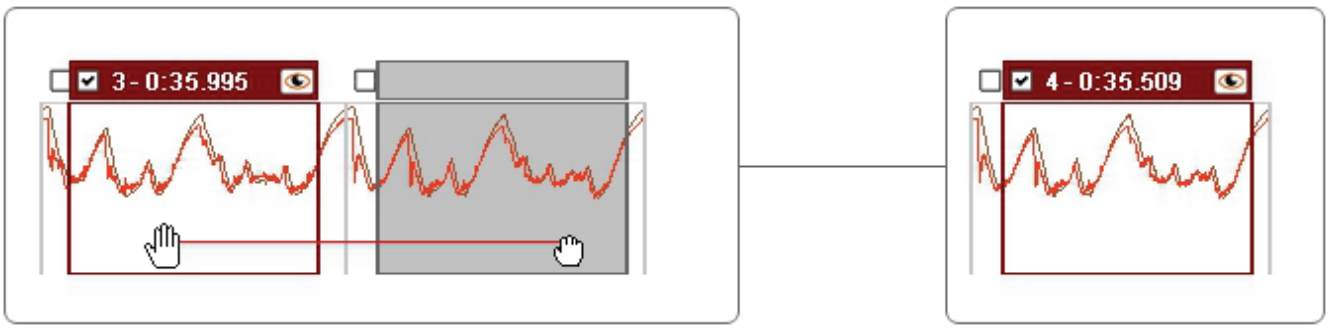
4.3.5 – Graph Slice Analysis/GPS Time Mode

In "**Slice Analysis**" mode:

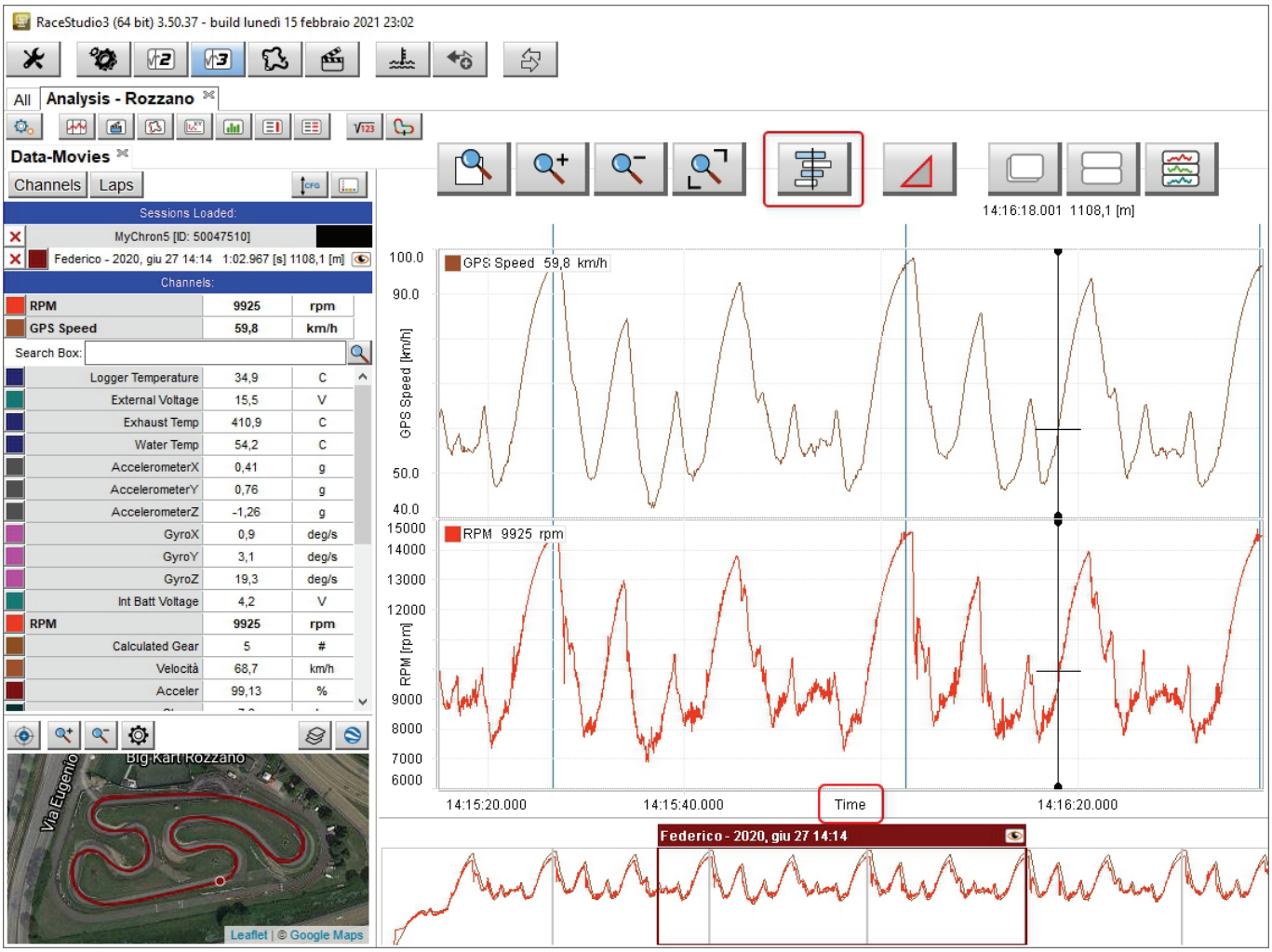
- you can have both Time or Distance on the abscissa axis
- the track box, the boxes in the storyboard and the central graph show the part of the track that is being analysed
- the graph can be zoomed in/out with the mouse wheel.



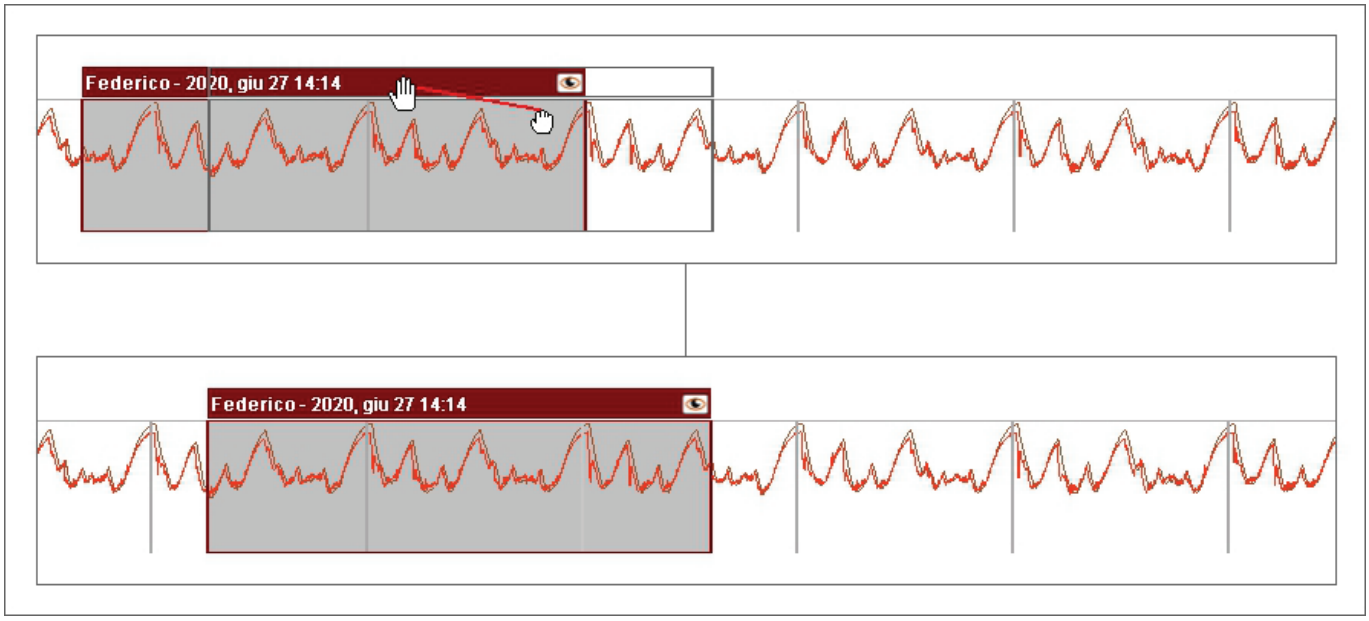
- dragging and dropping the selection in the storyboard you can see the same slice of a lap in the following lap; in the example below you moved the slice form lap 3 to lap 4.



In "**GPS Timing**" mode the abscissa axis shows "Time" and the storyboard selects a fixed range of time; the graph can be zoomed in/out with the mouse wheel.



- dragging and dropping the selection in the storyboard the slice of race shown in the graph is moved as shown here below.



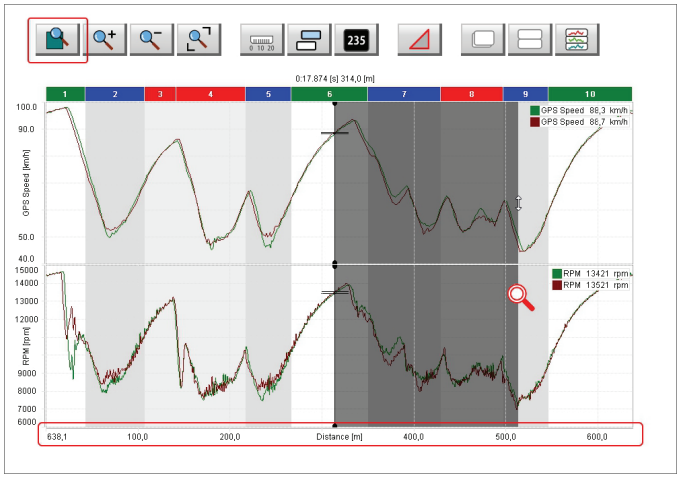
4.3.6 – Graph zooming

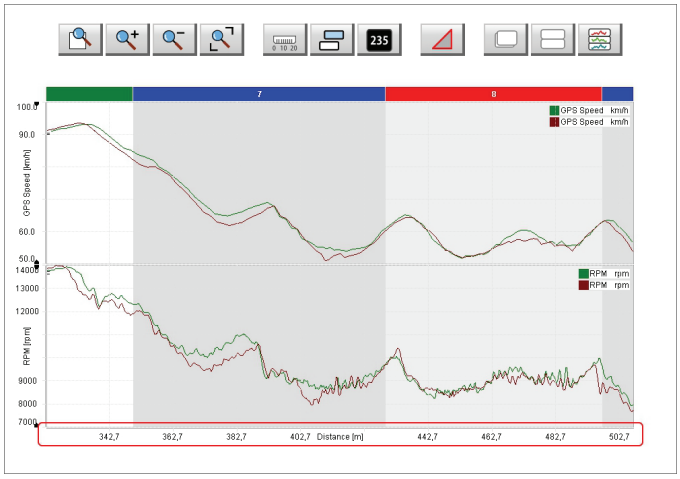
With the zoom buttons you can:

- Activate/deactivate the custom zoom
- zoom in/out and reset the graph zoom

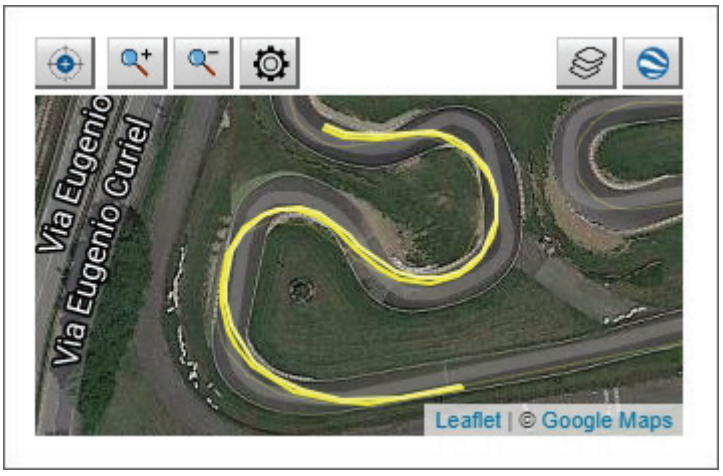
If you want to **zoom in a specific part of the graph**:

- click on the zoom icon and it activates (left image below)
- hook the cursor
- a magnifying lens appears: drag the cursor as desired and the selected part is highlighted in dark grey (left image below)
- release the cursor and the graph is zoomed in (image here below on the right)





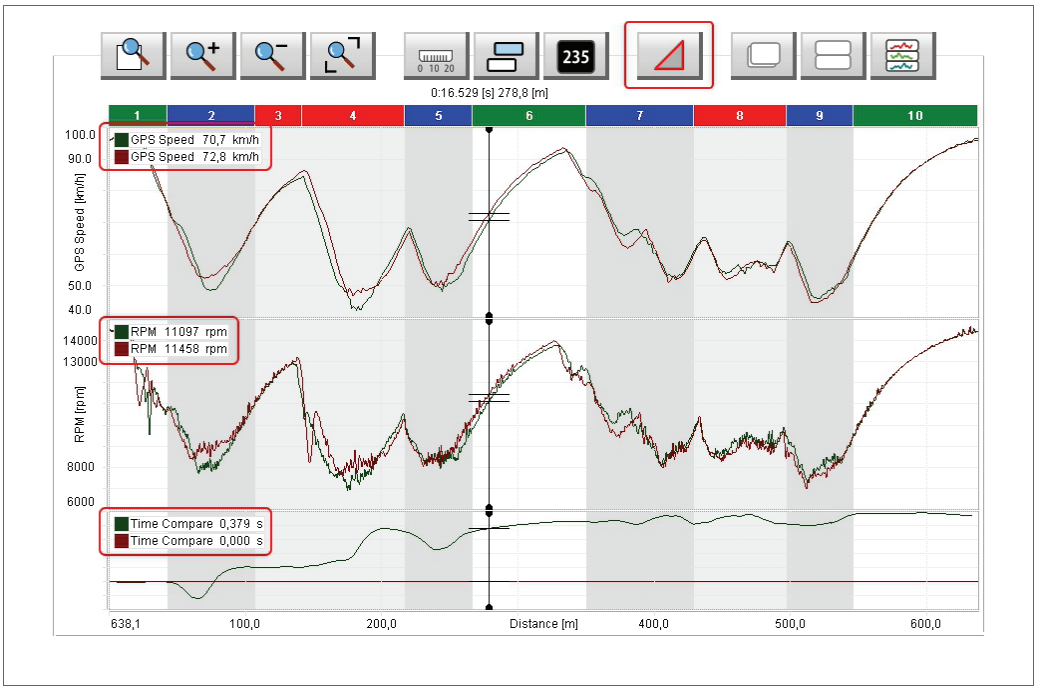
Once the graph is zoomed in the part of the track you have zoomed in is shown in the related box bottom left of the software page.

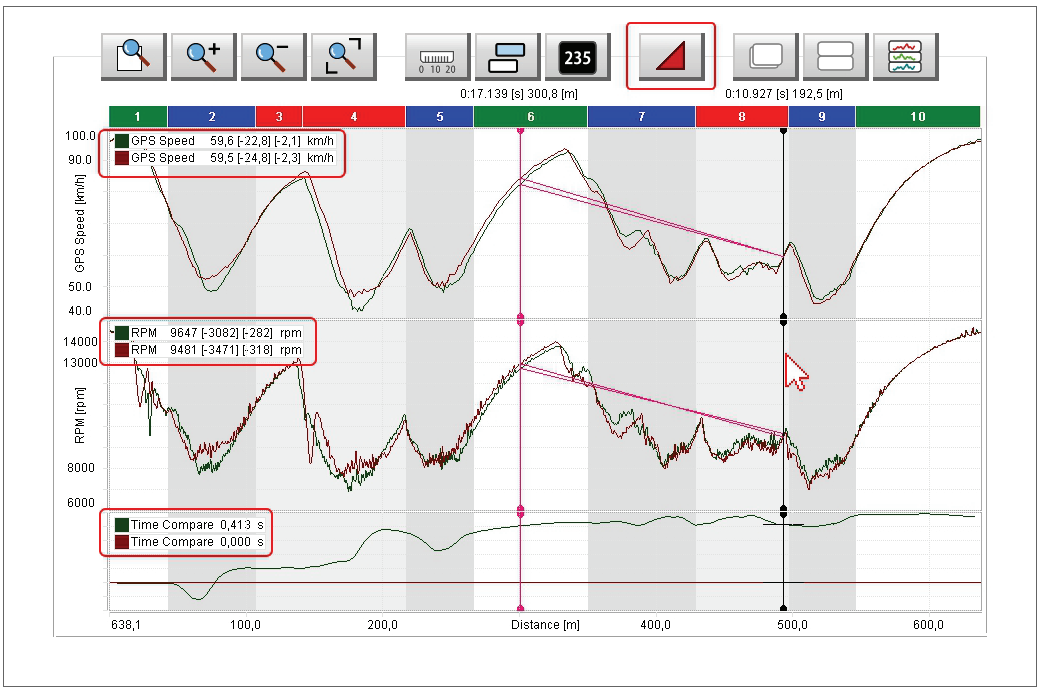


4.3.7 – Graph in delta Mode

Using "Delta" mode you can analyse the delta of a channel in two points. To do so:

- click "Delta" icon: top image below
- hook the graph cursor and drag it as you wish
- release the cursor: the delta is shown left of the graphs as shown in the bottom image.

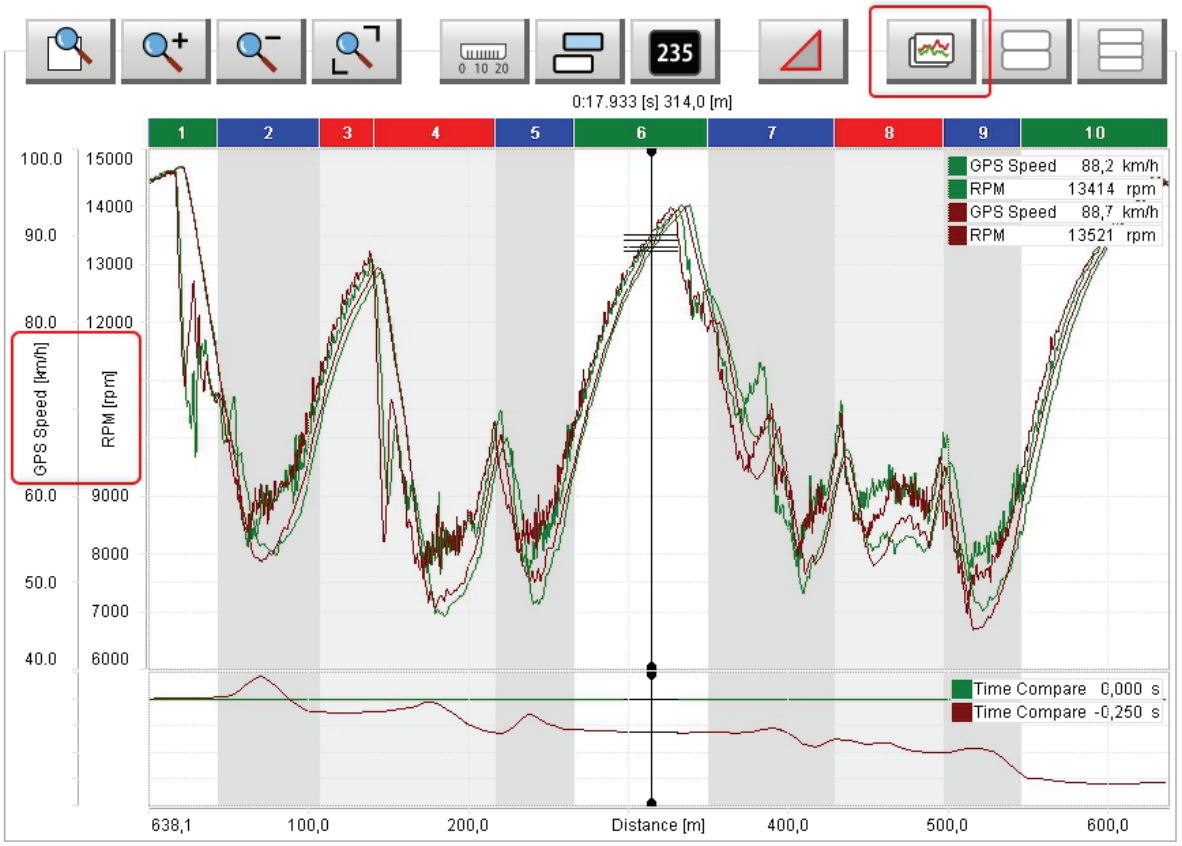




4.3.8 – Graphs plotting overlapped

When the graph plotting is overlapped all channels are shown in the same graph and the values of different channels belonging to the same session are identified by the same colour as shown. In the example below:

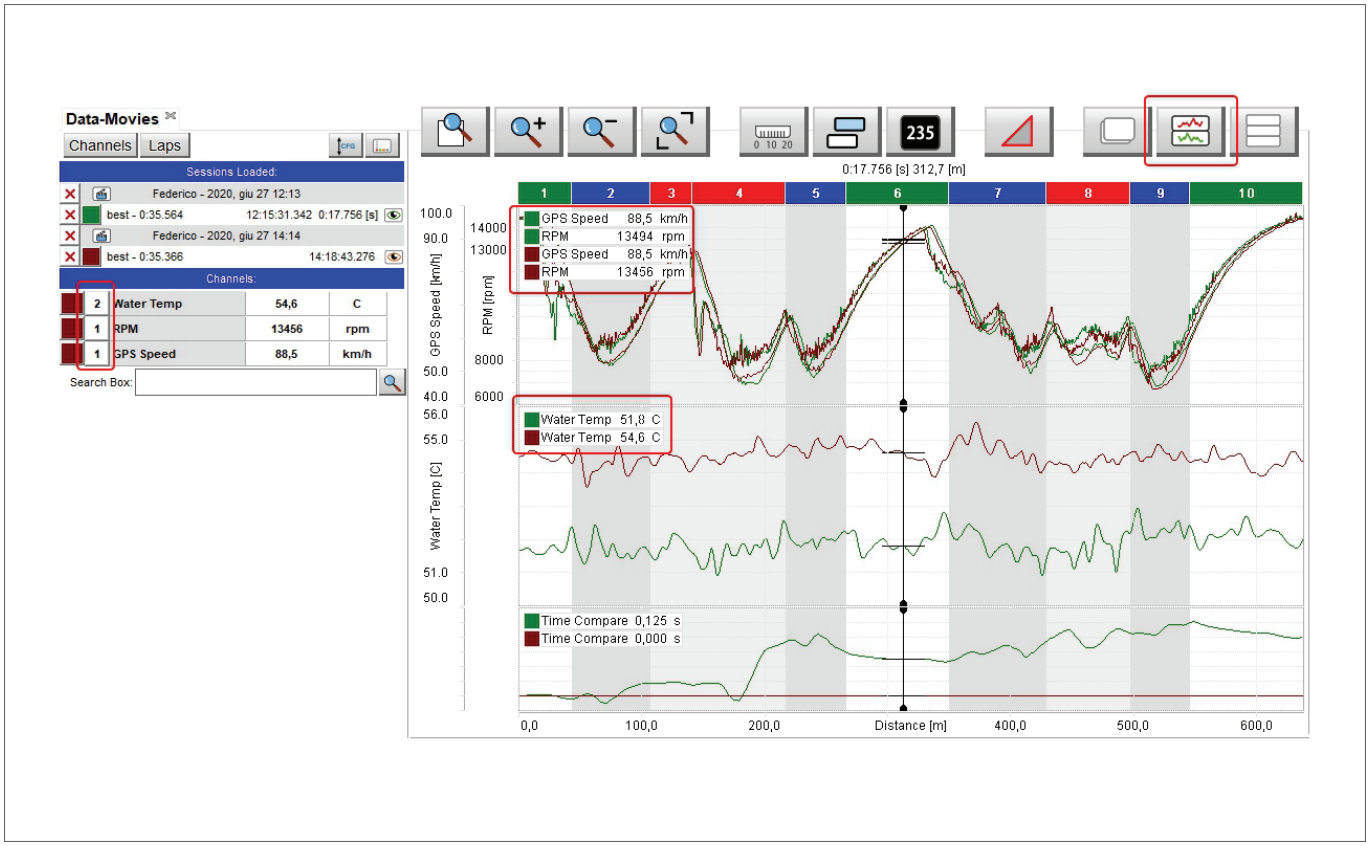
- a session is plotted green and the other burgundy
- the channels you are analysing are both indicated on the ordinate axis
- the graph plot base is distance and so "Time Compare" graph is shown bottom of the main graph if enabled in setting dialog window (paragraph 4.3.1).



4.3.9 – Graphs plotting mixed

When the graph plotting is mixed you can decide where to plot each channel and the values of different channels belonging to the same session are identified by the same colour. In the example below:

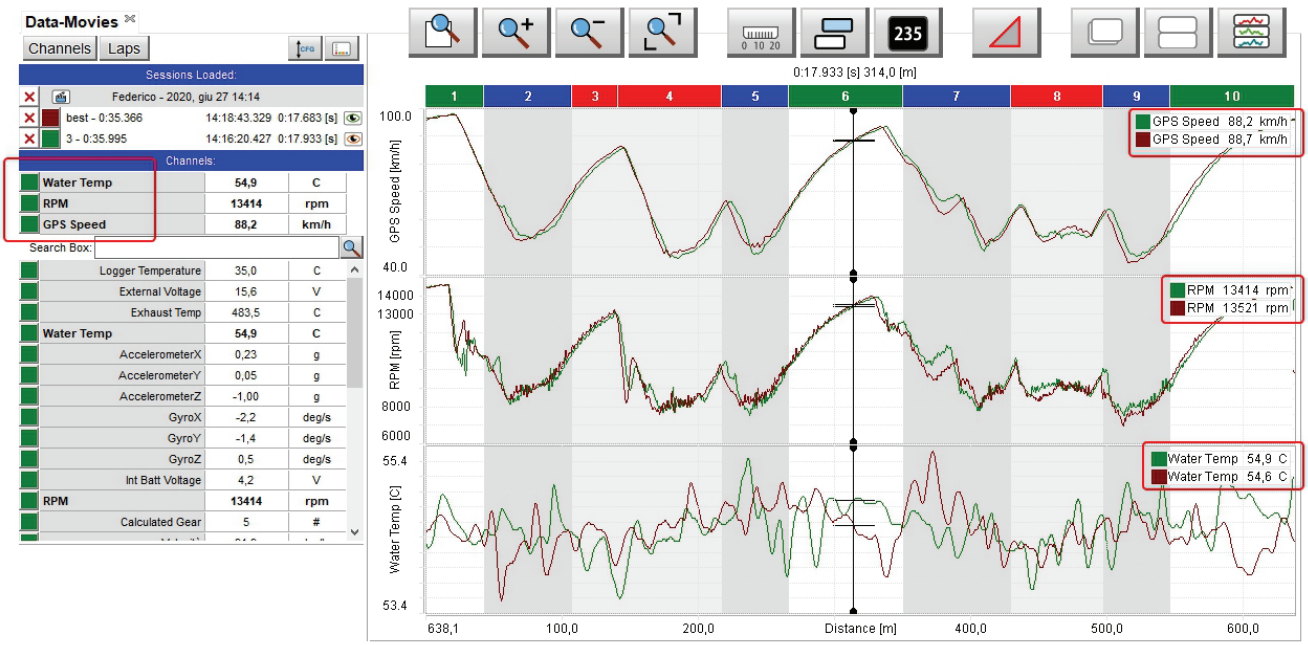
- a session is plotted green and the other burgundy
- RPM and GPS Speed channels are plotted in graph "1" (Top)
- Water Temperature is plotted in graph "2" (central)
- You can change the graph where a channel is plotted clicking on the box left of the channel in channels table
- max allowed number of graphs is six
- the channels you are analysing are both indicated on the ordinate axis
- the graph plot base is distance and so "Time Compare" graph is always shown bottom of the other graphs if enabled in setting dialog window (paragraph 4.3.1).



4.3.10 – Graph plotting tiled

When the graph plotting is tiled each channel is plotted in a graph and the channels belonging to the same session are identified by the same colour. In the example below:

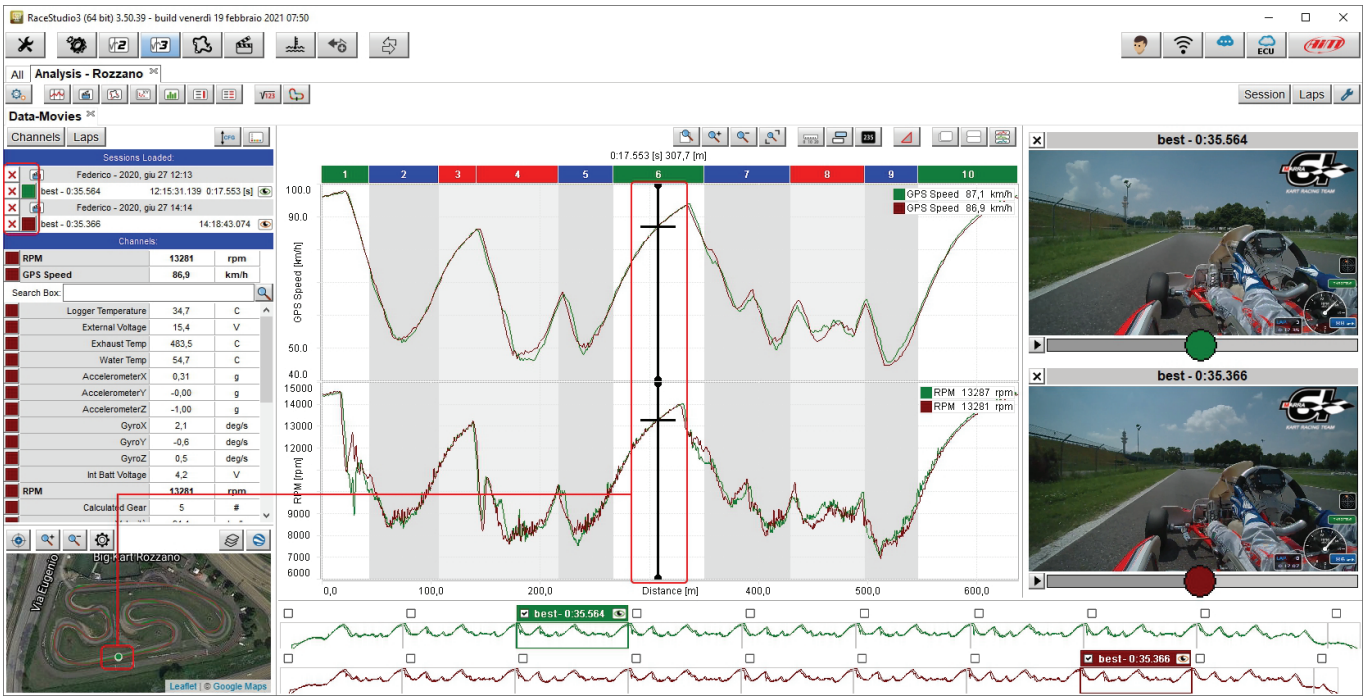
- a session is plotted green and the other burgundy
- plotted channels are RPM, Velocità (Speed) and water temperature
- the channels you are analysing are indicated on the ordinate axis and in the channels tags (if enabled in setting dialog window – see paragraph 4.3.1) top left of each graph



4.4 – The movie(s)

Right of the software view is movie view that shows videos included in the sessions up to four according to the settings (see paragraph 3.1 for further information). Enabling the corresponding checkbox in “Settings” dialog window videos can be hidden7unhidden when the space bar get pressed as explained in channels table (paragraph 4.1).
The session each video refers to is identified by the colour play button in the video that recalls the colour of the sessions in channels table top left of the software view.
Pressing “play” button on one video:

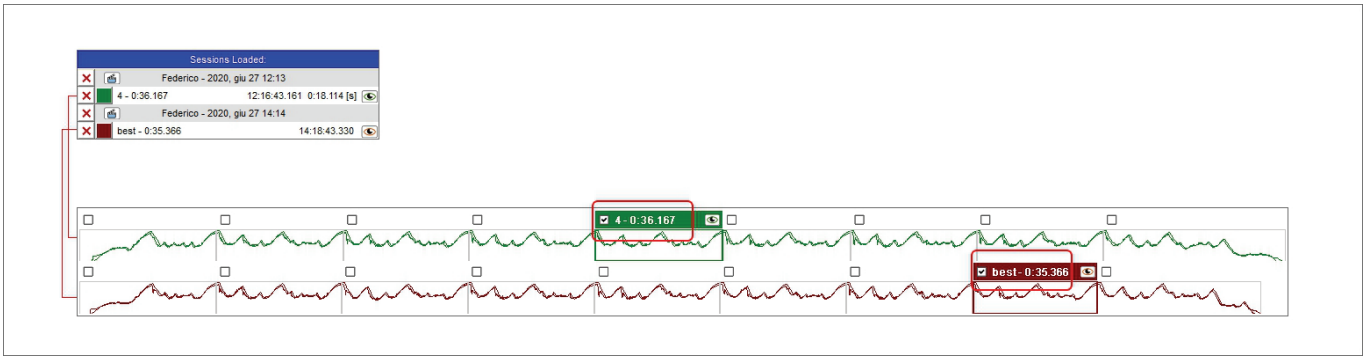
- all video starts
- the cursor in the central graph moves following the movie
- the track map box bottom left of the software view shows the vehicle moving on the track



4.5 – The storyboard

Bottom of the software view is the storyboard. By default it shows the graphs of all laps of the session and if more sessions are open it shows so many rows as many sessions are open up to four according to the settings fixed (paragraph 3.1). Selecting a lap its lap time appears on the lap bar and if this is the best lap of the session it is indicated in the lap bar.
Using the setting dialog window (right click on the storyboard or press the setting icon on the top right keyboard) you can:

- show different channels in the storyboard as explained in paragraph 4.3.2.
- hide/unhide the storyboard pressing and re-pressing the space bar as explained in paragraph 4.1

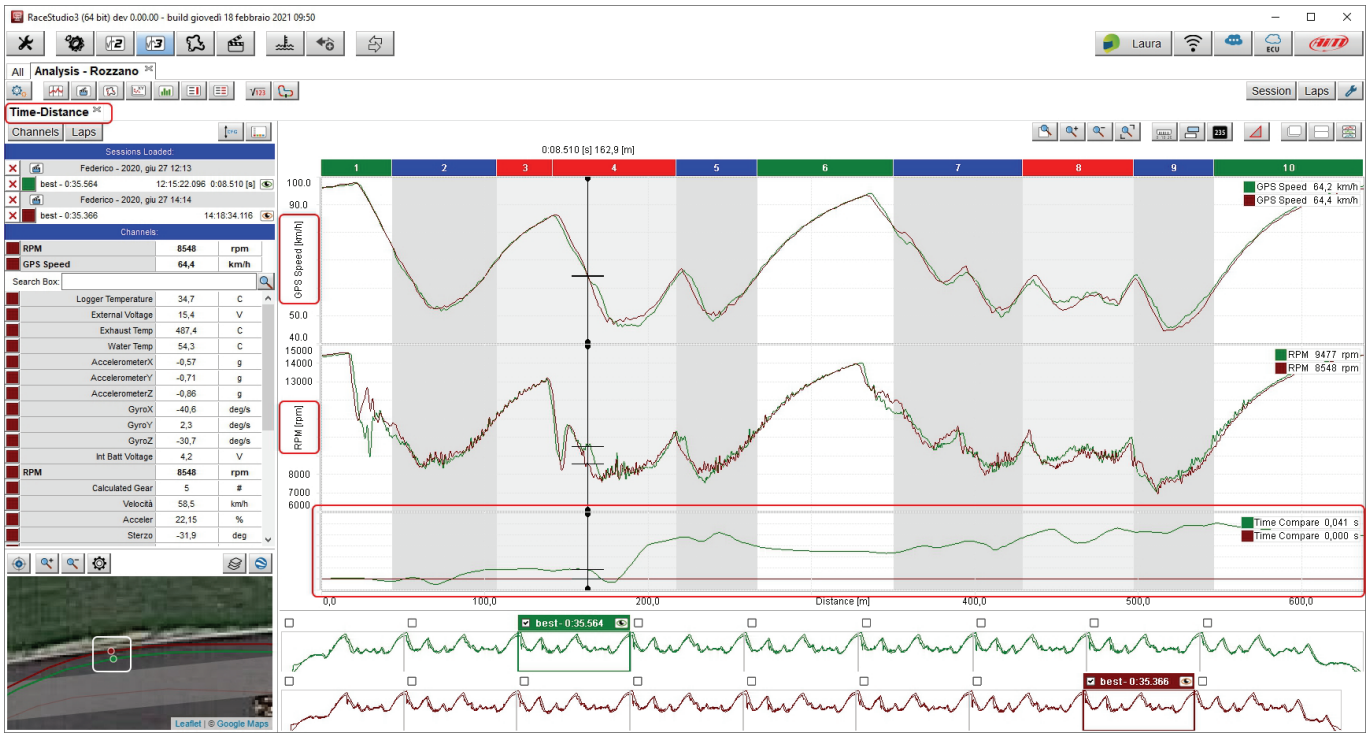


5 – Time-Distance layout

Pressing the icon shown here above on the top left keyboard of the view you enter “Time Distance” layout. It shows

- channels table (see paragraph 4.1) on the left of the view
- track map (see paragraph 4.2) bottom left of the view
- time-distance graph central, and time compare graph below if more laps are open and time compare is enabled in setting dialog window (see paragraph 4.3.1)
- the storyboard (see paragraph 4.6) bottom of the view

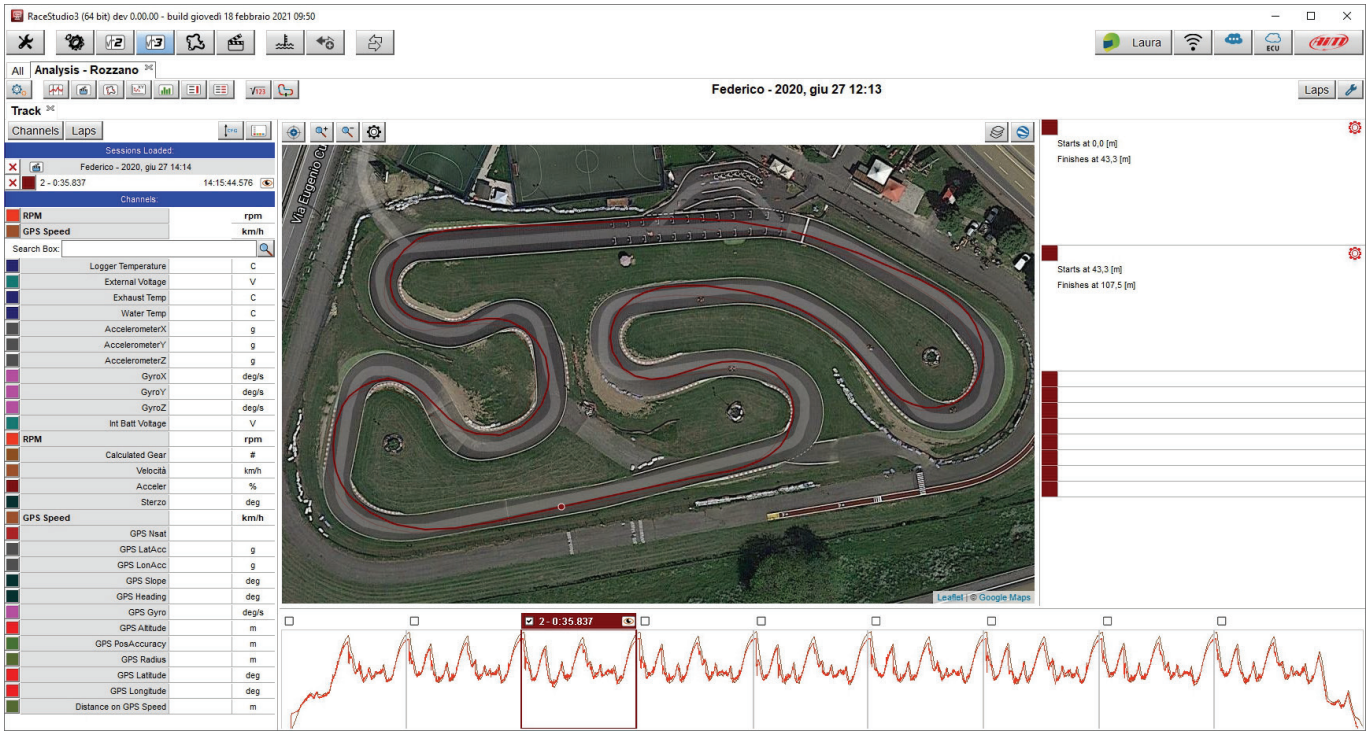
As highlighted in the image below, zooming in the track map you can see the position of the vehicle in the open laps.



6 – Track layout

Pressing the icon shown here above on the top left keyboard of the view you enter “Track” layout. It shows:

- channels table (see paragraph 4.1) on the left of the view
- track map central with two keyboards on top
- the storyboard (see paragraph 4.6) bottom of the view
- splits start and finish time in cumulative mode on the right

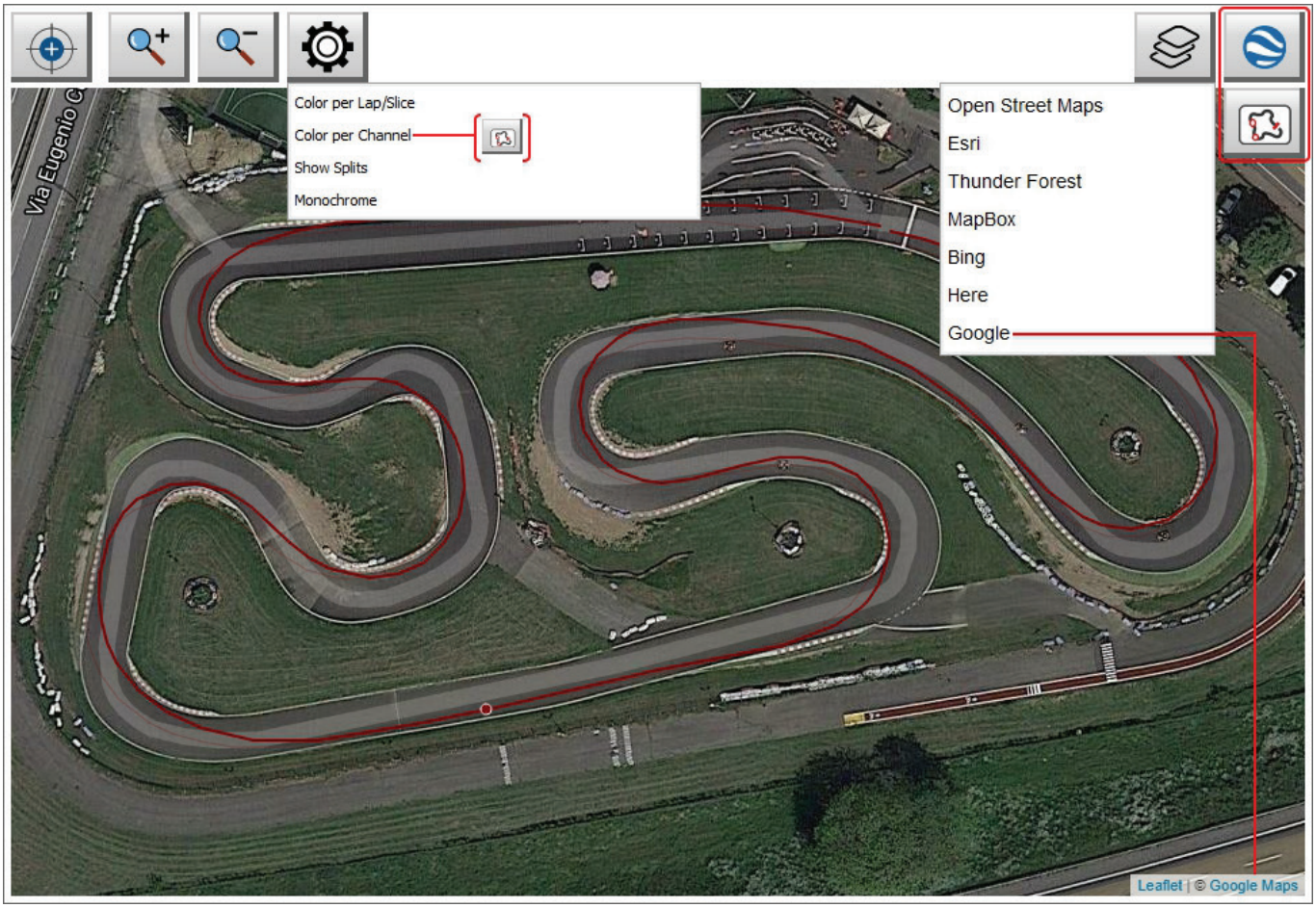


6.1 – The track map

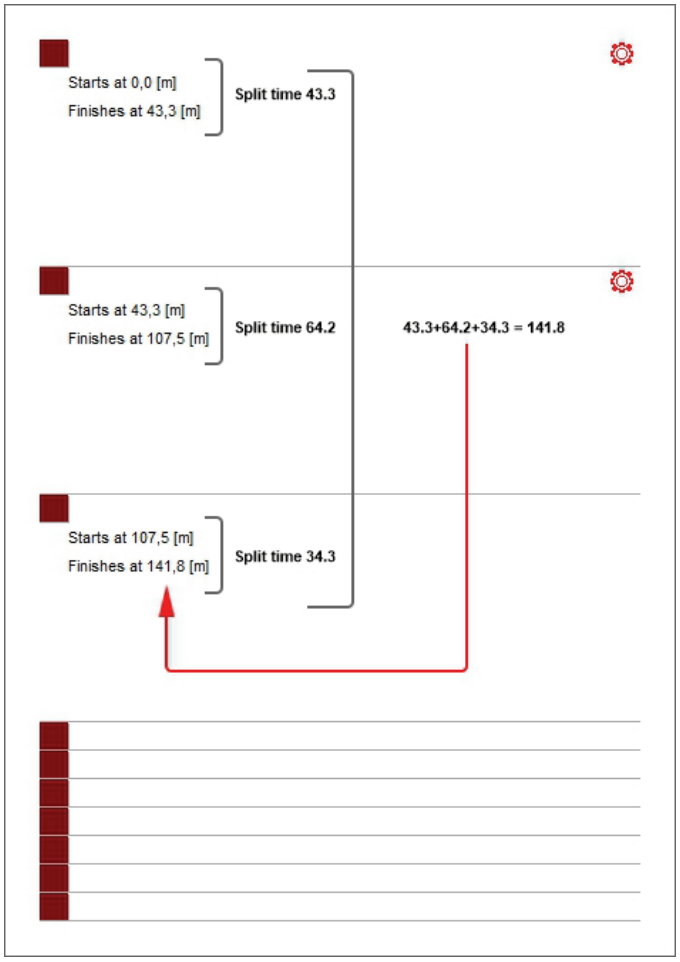
Central in track layout is the track map. It can be shown in different ways trough different tile suppliers.
The map has two top keyboards:

- on the left: position, zoom and setting;
- on the right: tile providers and map mode; map mode button changes switching from map webbing to track mode as highlighted below.

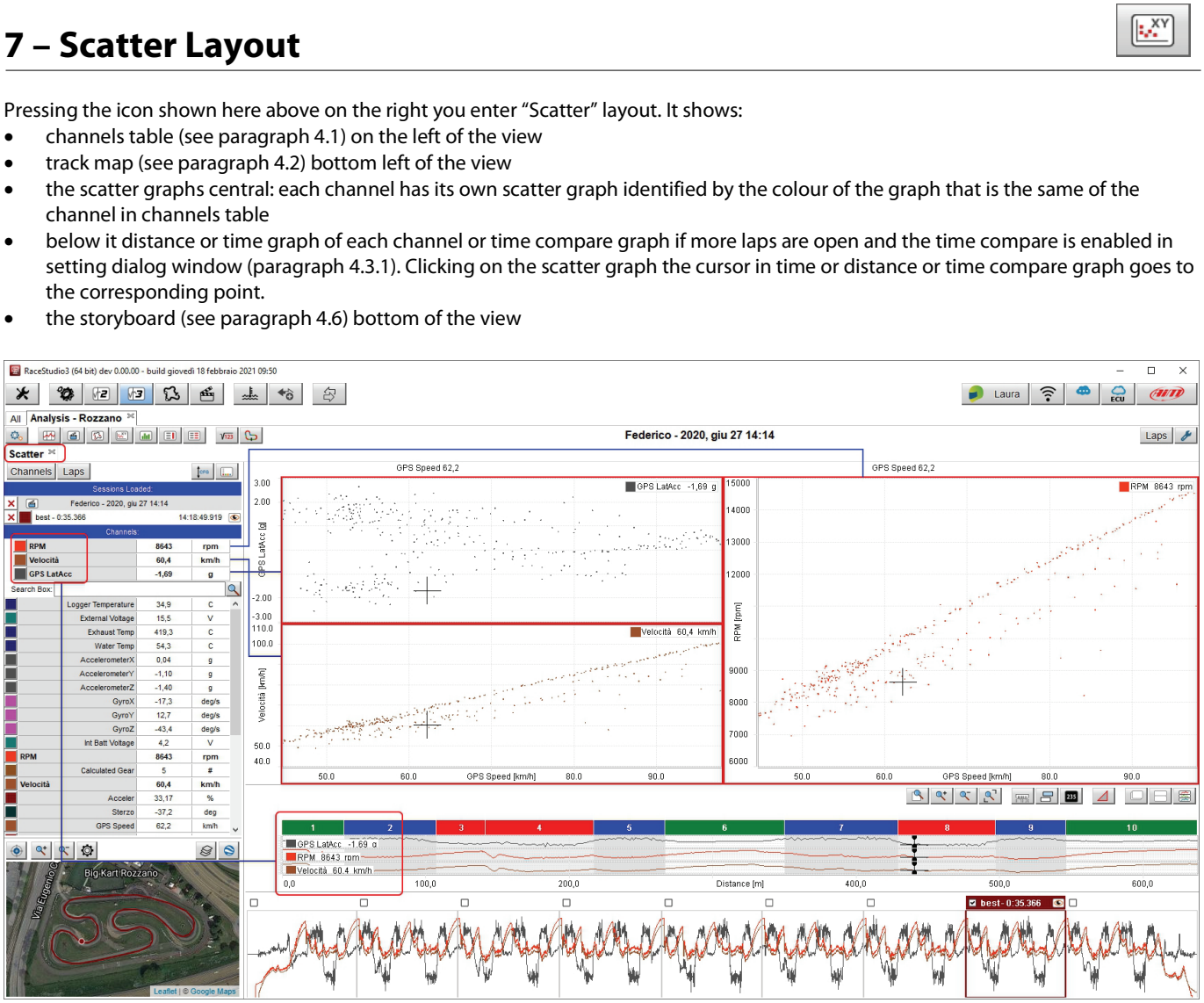
Default tile is Google Maps and default mode is web mapping ( ) as shown below.
Please note: to show a different colour for each channel the map mode needs to be track mode ( ).



Right of track layout is a list of row that hides data about the track split. Mousing over each row a setting icon appears; clicking it you see lap start and finish time of each split in accumulative mode.



7 – Scatter Layout

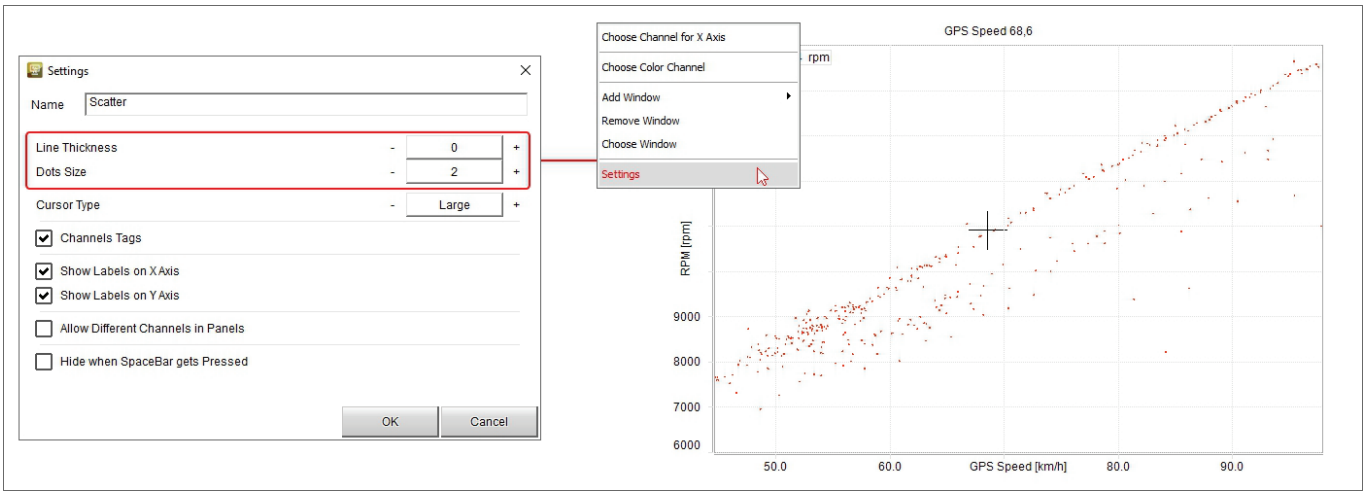


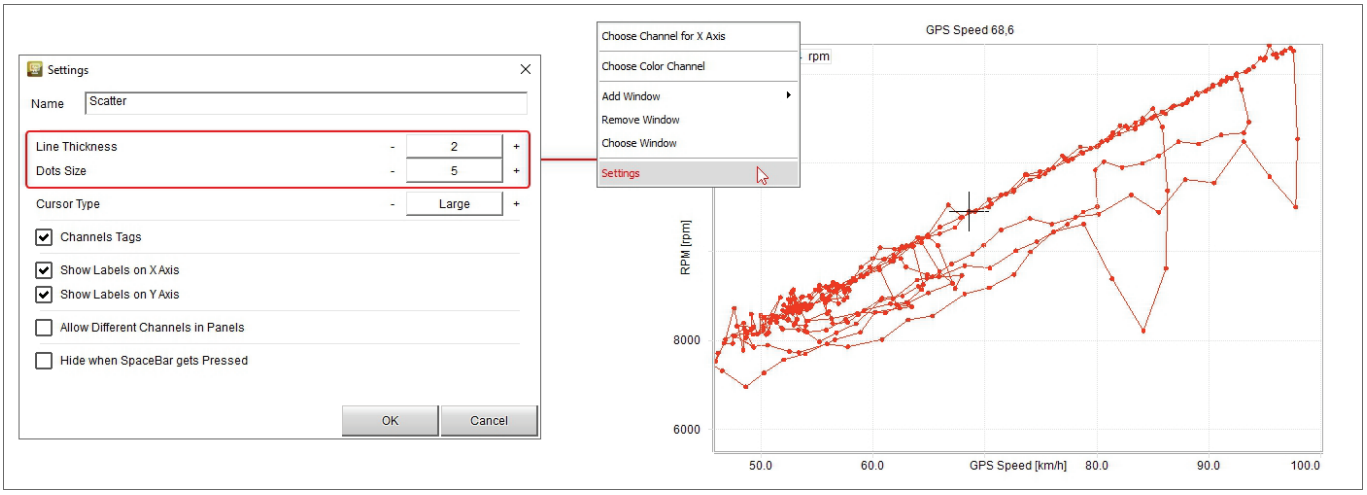
Pressing the icon shown here above on the right you enter “Scatter” layout. It shows:

- channels table (see paragraph 4.1) on the left of the view
- track map (see paragraph 4.2) bottom left of the view
- the scatter graphs central: each channel has its own scatter graph identified by the colour of the graph that is the same of the channel in channels table
- below it distance or time graph of each channel or time compare graph if more laps are open and the time compare is enabled in setting dialog window (paragraph 4.3.1). Clicking on the scatter graph the cursor in time or distance or time compare graph goes to the corresponding point.
- the storyboard (see paragraph 4.6) bottom of the view

The scatter graph can also show through lines the sequence of the acquisition of the points. To set the graph right click on it and select "Settings" in the menu that is prompted. Here below RPM scatter graphs RPM/GPS Speed are shown:

- top line thickness set on "0" and dots size set on "2": it only shows the points
- bottom line thickness set on "2" and dots size set on "5": it shows the sequence of the points through lines



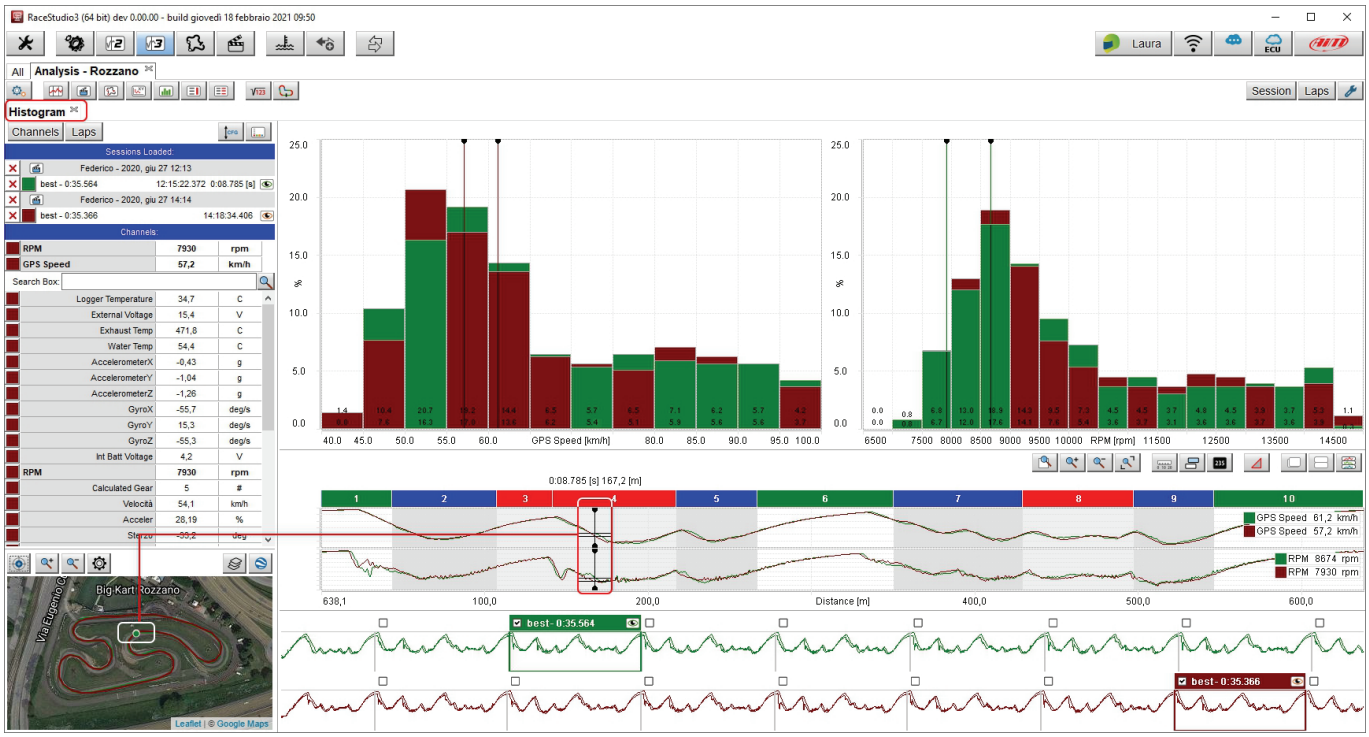


8 – Histogram Layout

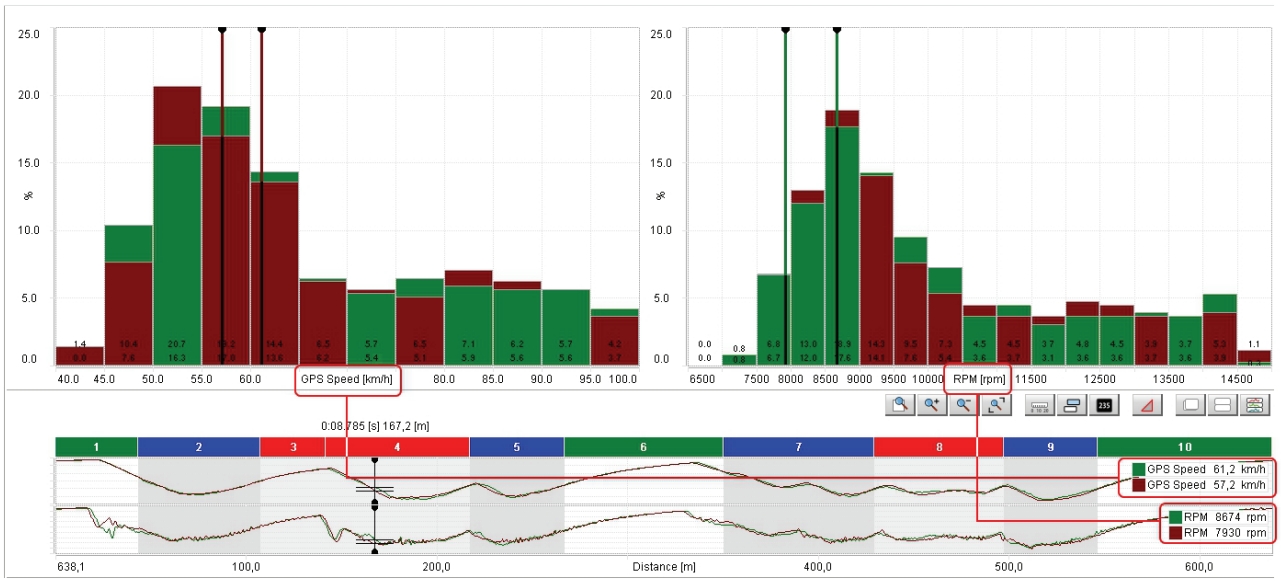
Pressing the icon shown here above on the top left keyboard of the view you enter “Histogram” layout. It shows:

- channels table (see paragraph 4.1) on the left
- track map (see paragraph 4.2) bottom left
- the histogram graph central
- below it distance or time graph and time compare graph if more laps are open and the time compare is enabled in setting dialog window (paragraph 4.3.1)
- the storyboard (see paragraph 4.6) bottom of the view

The position of the cursor in the graph below the histogram is also shown on the track map bottom right of the view.

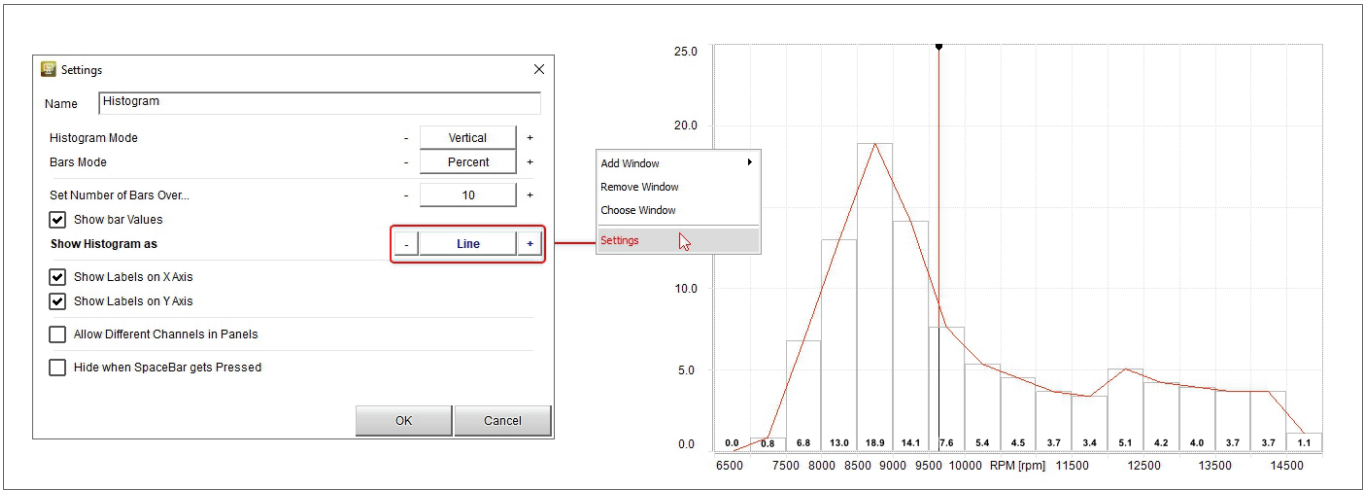


The view opens as many histograms as channels you loaded and each session is identified by a colour on the graph. The channels shown in the graphs under the histogram are plotted on the Abscissa axis. The coloured cursors of the histogram show the channel value in that point and the sessions are identified by the same colours.



The histogram can be shown as bars or as lines. To decide its layout right click on the graph and select “setting” option in the menu. “Setting” dialog window is prompted: choose the layout you prefer. Images below show:

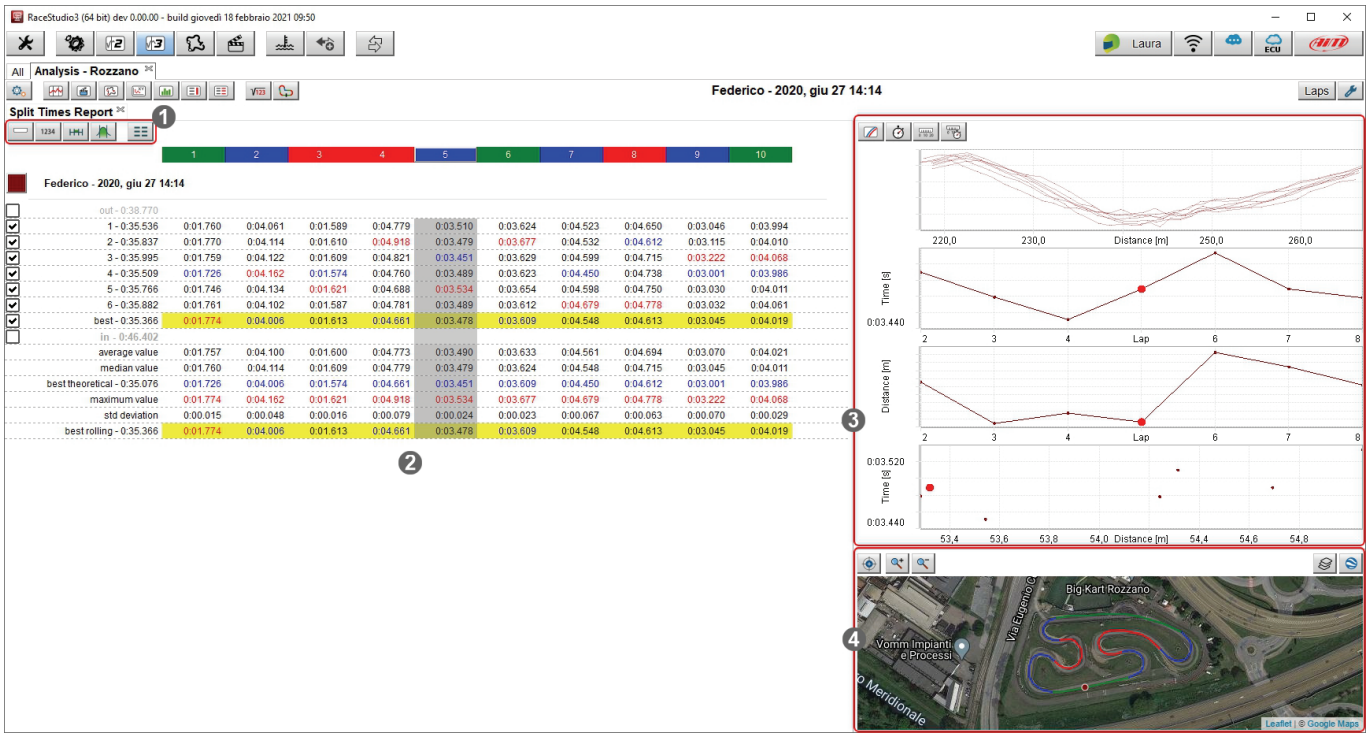
- histogram with bar layout on top
- histogram with lines layout bottom



9 – Split Times report layout

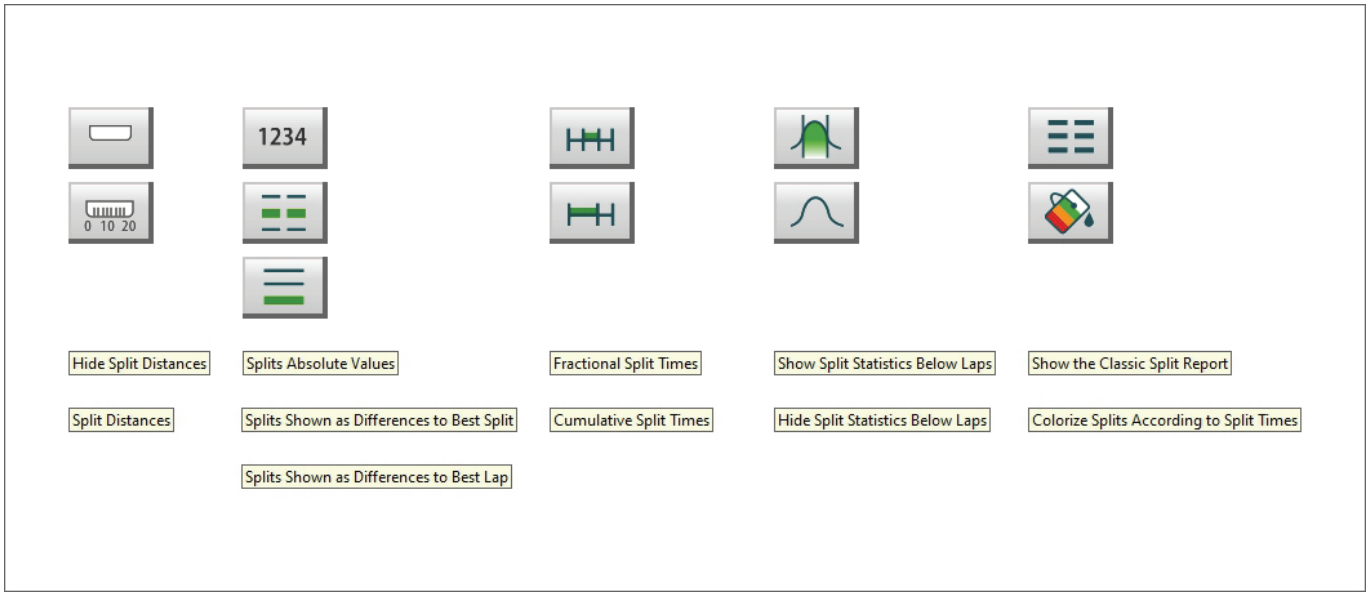
Pressing the icon shown here above on the right you enter “Split Times Report” layout. It shows:

- a keyboard on top of the view(**1**); each button can show different data and the second and the third button from the left can also be variously combined as explained in the following paragraphs
- Session data in the central table (**2**), with or without “Statistics” (see paragraph 9.6); each lap can be enabled/disabled checking/unchecking the corresponding checkbox on the left.
- Graphs of the selected split on the right (**3**) Each graph can be hidden/unhidden with the related button (paragraph 9.11).
- Track map bottom of the graphs (4)



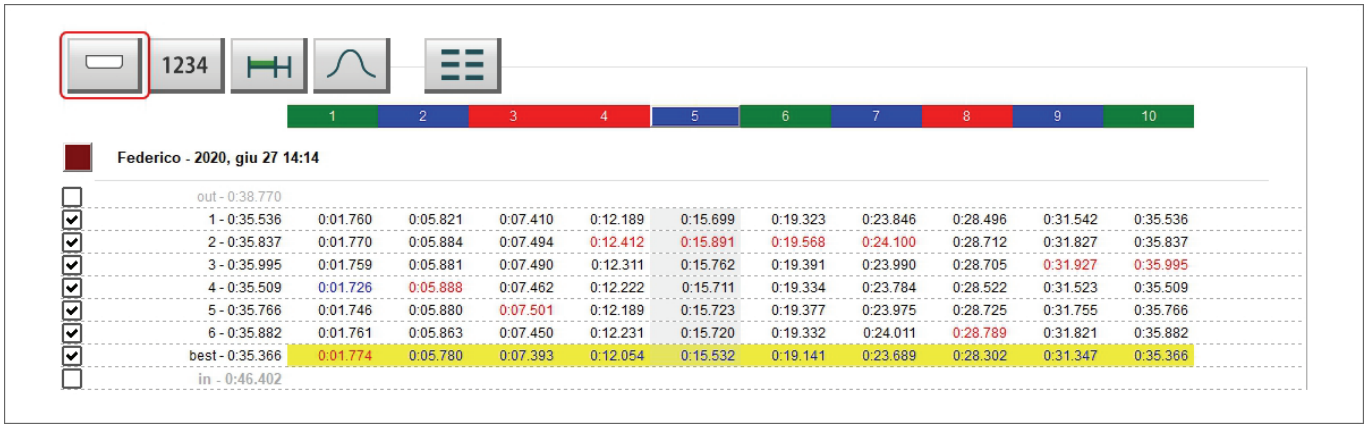
9.1 – The top keyboard

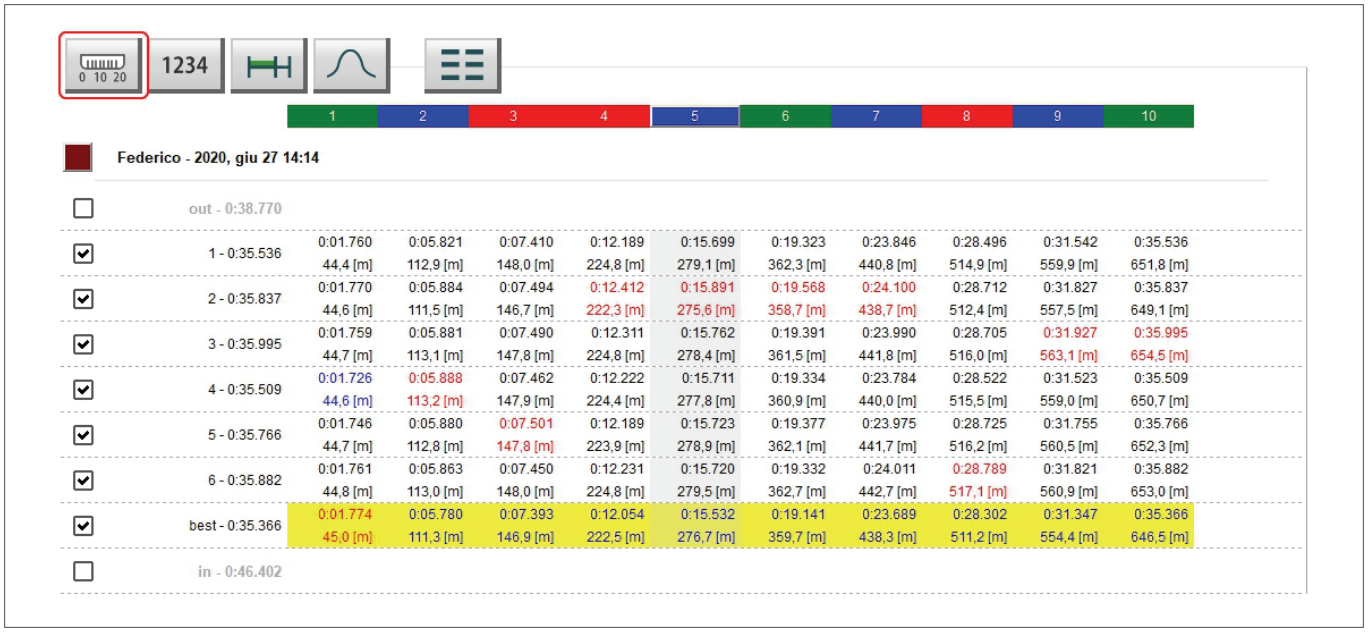
As said before, the buttons of the top keyboard (**1** in the image above) change and switch among different functions that show the data in various ways allowing different data analysis that will be explained in the following paragraphs.



9.1 – Show/Hide Distance

Pressing “Distance” button an additional row can be shown/hidden under the split times of each split of each lap. The images below shows the central table without distance on top and the central table with distance bottom.

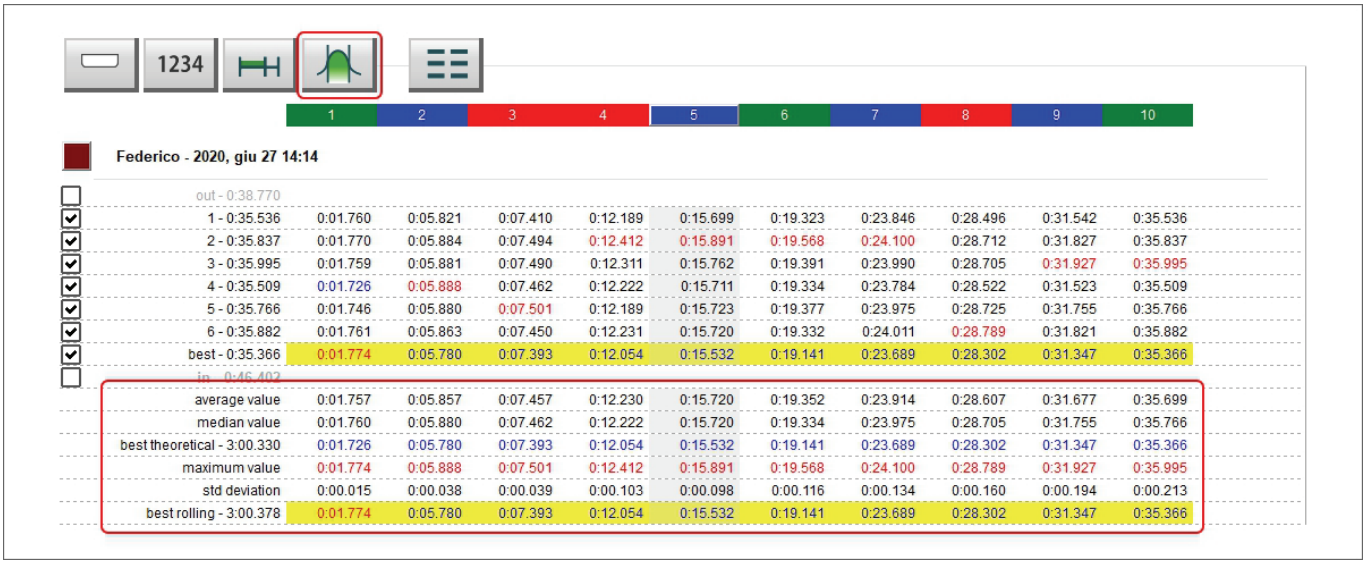




9.2 – Statistics

Pressing Statistics button a lot of information are can be shown/hidden bottom of the laps, to say:

- Average value: it shows the average[1] time value of each split (see paragraph 9.2.1)
- Median value: it shows the median[2] time value of each split (see paragraph 9.2.2)
- Best theoretical: this lap time is the addition of all best split times no matter what lap they belong to (see paragraph 9.2.3)
- Maximum value: it's the higher time obtained for each split; these values are written in red in the table below the statistics
- Standard deviation (in the split): this value allows to understand how constant the racer is; a low standard deviation value means the driving style follows a rule and there are no strange behaviours in the vehicle
- Best rolling: is the best lap time really made also if the splits belong to different laps assumed that they are successive (see paragraph 9.2.4).



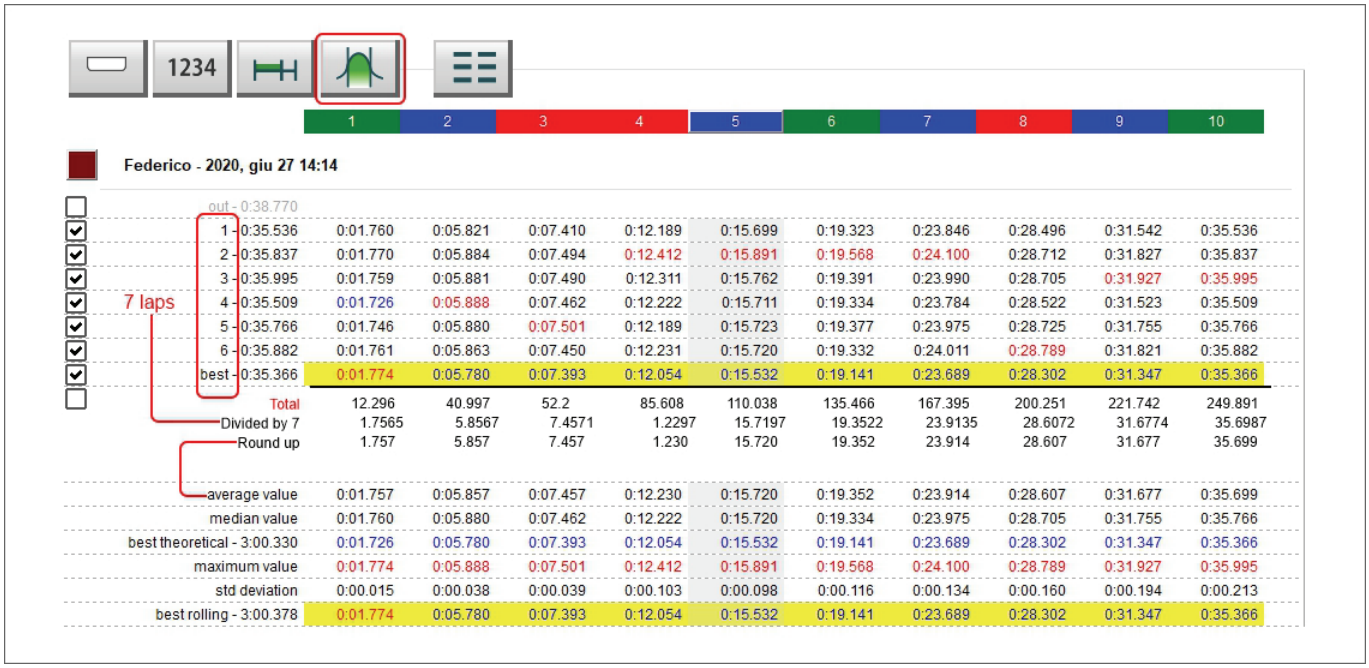
out - 0:38.770										
1 - 0:35.536	0:01.760	0:05.821	0:07.410	0:12.189	0:15.699	0:19.323	0:23.846	0:28.496	0:31.542	0:35.536
2 - 0:35.837	0:01.770	0:05.884	0:07.494	0:12.412	0:15.891	0:19.568	0:24.100	0:28.712	0:31.827	0:35.837
3 - 0:35.995	0:01.759	0:05.881	0:07.490	0:12.311	0:15.762	0:19.391	0:23.990	0:28.705	0:31.927	0:35.995
4 - 0:35.509	0:01.726	0:05.888	0:07.462	0:12.222	0:15.711	0:19.334	0:23.784	0:28.522	0:31.523	0:35.509
5 - 0:35.766	0:01.746	0:05.880	0:07.501	0:12.189	0:15.723	0:19.377	0:23.975	0:28.725	0:31.755	0:35.766
6 - 0:35.882	0:01.761	0:05.863	0:07.450	0:12.231	0:15.720	0:19.332	0:24.011	0:28.789	0:31.821	0:35.882
best - 0:35.366	0:01.774	0:05.780	0:07.393	0:12.054	0:15.532	0:19.141	0:23.689	0:28.302	0:31.347	0:35.366
in - 0:46.402										
average value	0:01.757	0:05.857	0:07.457	0:12.230	0:15.720	0:19.352	0:23.914	0:28.607	0:31.677	0:35.699
median value	0:01.760	0:05.880	0:07.462	0:12.222	0:15.720	0:19.334	0:23.975	0:28.705	0:31.755	0:35.766
best theoretical - 3:00.330	0:01.726	0:05.780	0:07.393	0:12.054	0:15.532	0:19.141	0:23.689	0:28.302	0:31.347	0:35.366
maximum value	0:01.774	0:05.888	0:07.501	0:12.412	0:15.891	0:19.568	0:24.100	0:28.789	0:31.927	0:35.995
std deviation	0:00.015	0:00.038	0:00.039	0:00.103	0:00.098	0:00.116	0:00.134	0:00.160	0:00.194	0:00.213
best rolling - 3:00.378	0:01.774	0:05.780	0:07.393	0:12.054	0:15.532	0:19.141	0:23.689	0:28.302	0:31.347	0:35.366

[1] Average value is obtained summing up all items and dividing the result by the number of items

[2] Median value: is the value that, ordered the items of a list, is central in the list. if the number of items is odd the median value is one while if the number of items is even the median value is obtained summing up the two central items of the list and dividing the result by two.

9.2.1 – Average value

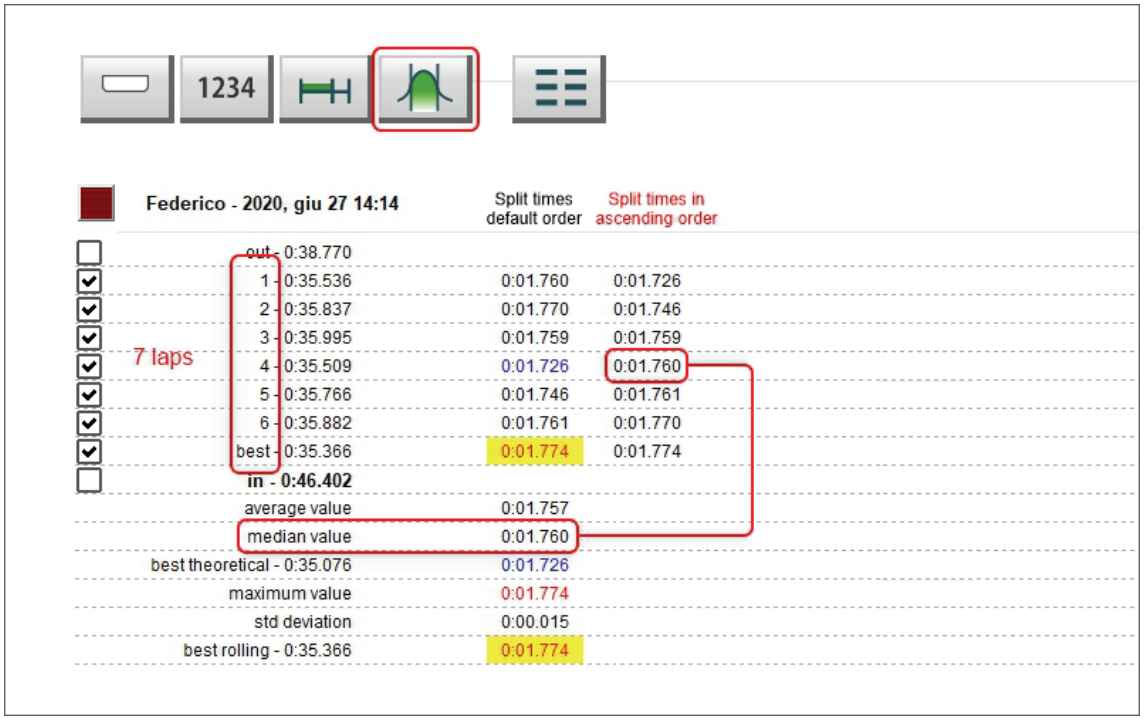
As shown below average value is obtained summing up all split times and dividing the result by the number of items. In this case 7 laps are considered.

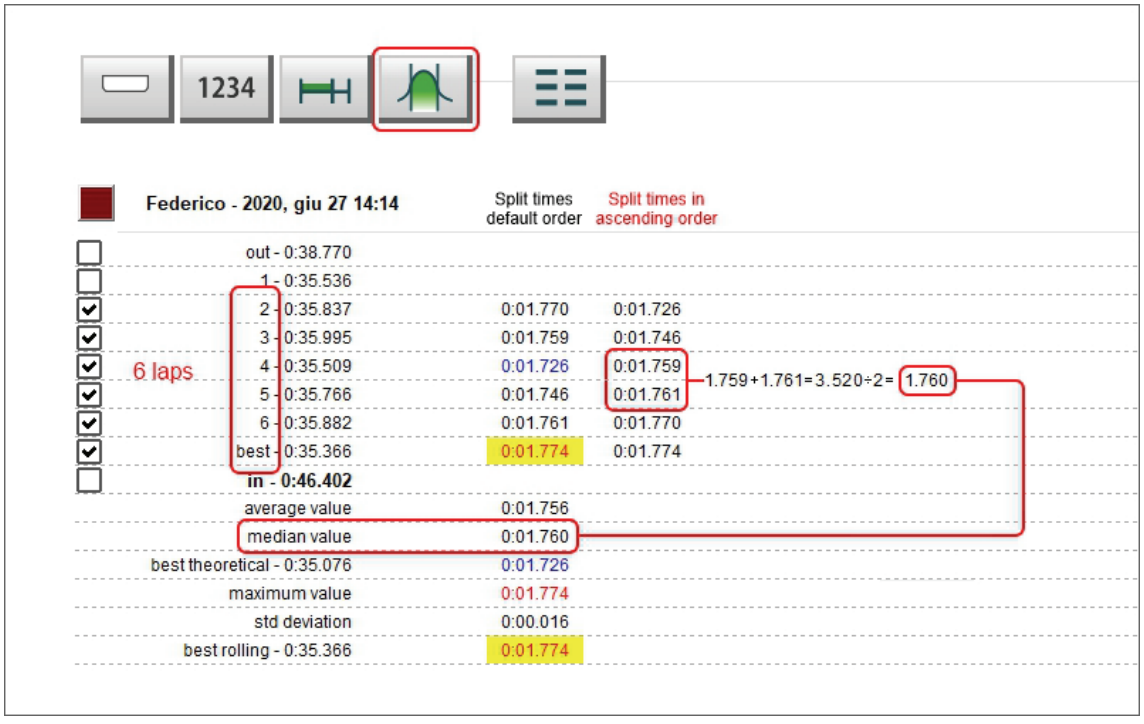


out - 0:38.770											
1 - 0:35.536	0:01.760	0:05.821	0:07.410	0:12.189	0:15.699	0:19.323	0:23.846	0:28.496	0:31.542	0:35.536
2 - 0:35.837	0:01.770	0:05.884	0:07.494	0:12.412	0:15.891	0:19.568	0:24.100	0:28.712	0:31.827	0:35.837
3 - 0:35.995	0:01.759	0:05.881	0:07.490	0:12.311	0:15.762	0:19.391	0:23.990	0:28.705	0:31.927	0:35.995
4 - 0:35.509	0:01.726	0:05.888	0:07.462	0:12.222	0:15.711	0:19.334	0:23.784	0:28.522	0:31.523	0:35.509
5 - 0:35.766	0:01.746	0:05.880	0:07.501	0:12.189	0:15.723	0:19.377	0:23.975	0:28.725	0:31.755	0:35.766
6 - 0:35.882	0:01.761	0:05.863	0:07.450	0:12.231	0:15.720	0:19.332	0:24.011	0:28.789	0:31.821	0:35.882
best - 0:35.366	0:01.774	0:05.780	0:07.393	0:12.054	0:15.532	0:19.141	0:23.689	0:28.302	0:31.347	0:35.366
Total	12.296	40.997	52.2	85.608	110.038	135.466	167.395	200.251	221.742	249.891
Divided by 7	1.7565	5.8567	7.4571	1.2297	15.7197	19.3522	23.9135	28.6072	31.6774	35.6987
Round up	1.757	5.857	7.457	1.230	15.720	19.352	23.914	28.607	31.677	35.699
average value	0:01.757	0:05.857	0:07.457	0:12.230	0:15.720	0:19.352	0:23.914	0:28.607	0:31.677	0:35.699
median value	0:01.760	0:05.880	0:07.462	0:12.222	0:15.720	0:19.334	0:23.975	0:28.705	0:31.755	0:35.766
best theoretical - 3:00.330	0:01.726	0:05.780	0:07.393	0:12.054	0:15.532	0:19.141	0:23.689	0:28.302	0:31.347	0:35.366
maximum value	0:01.774	0:05.888	0:07.501	0:12.412	0:15.891	0:19.568	0:24.100	0:28.789	0:31.927	0:35.995
std deviation	0:00.015	0:00.038	0:00.039	0:00.103	0:00.098	0:00.116	0:00.134	0:00.160	0:00.194	0:00.213
best rolling - 3:00.378	0:01.774	0:05.780	0:07.393	0:12.054	0:15.532	0:19.141	0:23.689	0:28.302	0:31.347	0:35.366

9.2.2 – Median Value

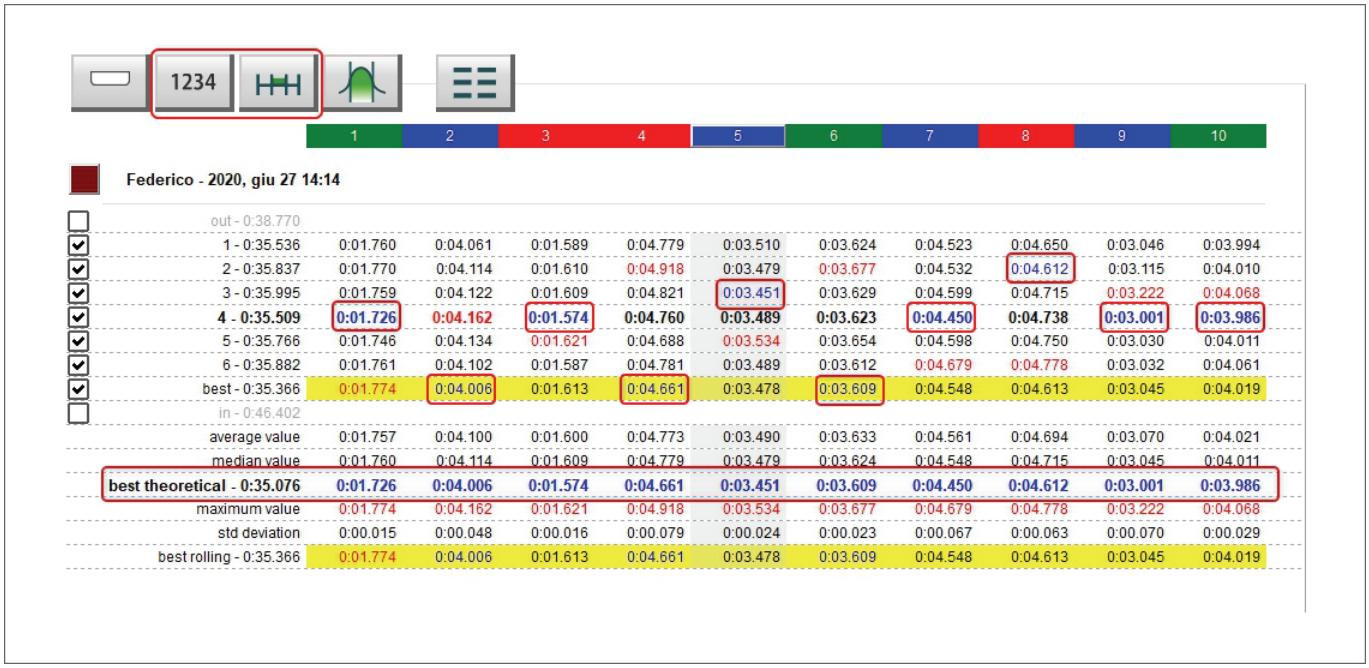
Once the items listed in an increasing order the median value is the one central in the list. If the number of items is odd the median value is one (top image) while if the number of items is even the median value is the average value of the two central items of the list (bottom).





9.2.3 – Best theoretical time

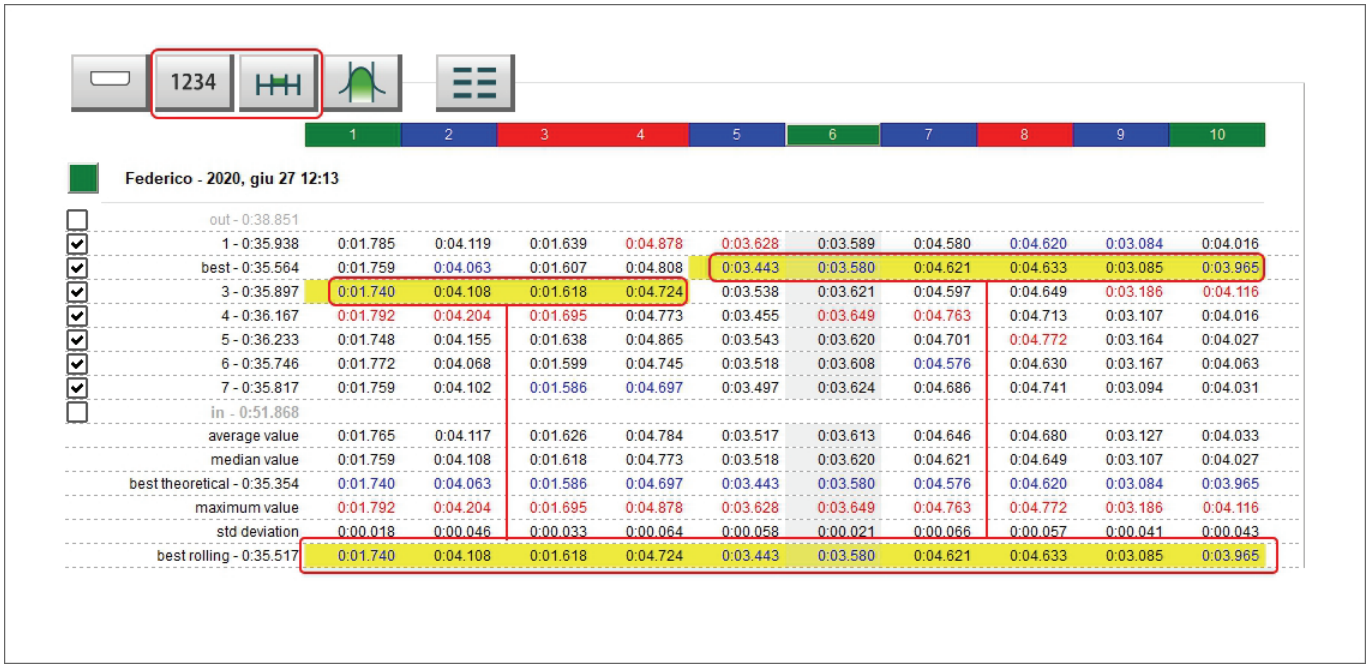
Best theoretical lap time is obtained summing all best split times of all considered laps. This is why is called theoretical. In the image below all best split times are highlighted and they are summed in the bottom best theoretical row in the statistics.



	1	2	3	4	5	6	7	8	9	10
Federico - 2020, giu 27 14:14										
out - 0:38.770										
1 - 0:35.536	0:01.760	0:04.061	0:01.589	0:04.779	0:03.510	0:03.624	0:04.523	0:04.650	0:03.046	0:03.994
2 - 0:35.837	0:01.770	0:04.114	0:01.610	0:04.918	0:03.479	0:03.677	0:04.532	0:04.612	0:03.115	0:04.010
3 - 0:35.995	0:01.759	0:04.122	0:01.609	0:04.821	0:03.451	0:03.629	0:04.599	0:04.715	0:03.222	0:04.068
4 - 0:35.509	0:01.726	0:04.162	0:01.574	0:04.760	0:03.489	0:03.623	0:04.450	0:04.738	0:03.001	0:03.986
5 - 0:35.766	0:01.746	0:04.134	0:01.621	0:04.688	0:03.534	0:03.654	0:04.598	0:04.750	0:03.030	0:04.011
6 - 0:35.882	0:01.761	0:04.102	0:01.587	0:04.781	0:03.489	0:03.612	0:04.679	0:04.778	0:03.032	0:04.061
best - 0:35.366	0:01.774	0:04.006	0:01.613	0:04.661	0:03.478	0:03.609	0:04.548	0:04.613	0:03.045	0:04.019
in - 0:46.402										
average value	0:01.757	0:04.100	0:01.600	0:04.773	0:03.490	0:03.633	0:04.561	0:04.694	0:03.070	0:04.021
median value	0:01.760	0:04.114	0:01.609	0:04.779	0:03.479	0:03.624	0:04.548	0:04.715	0:03.045	0:04.011
best theoretical - 0:35.076	0:01.726	0:04.006	0:01.574	0:04.661	0:03.451	0:03.609	0:04.450	0:04.612	0:03.001	0:03.986
maximum value	0:01.774	0:04.162	0:01.621	0:04.918	0:03.534	0:03.677	0:04.679	0:04.778	0:03.222	0:04.068
std deviation	0:00.015	0:00.048	0:00.016	0:00.079	0:00.024	0:00.023	0:00.067	0:00.063	0:00.070	0:00.029
best rolling - 0:35.366	0:01.774	0:04.006	0:01.613	0:04.661	0:03.478	0:03.609	0:04.548	0:04.613	0:03.045	0:04.019

9.2.4 – Best rolling time

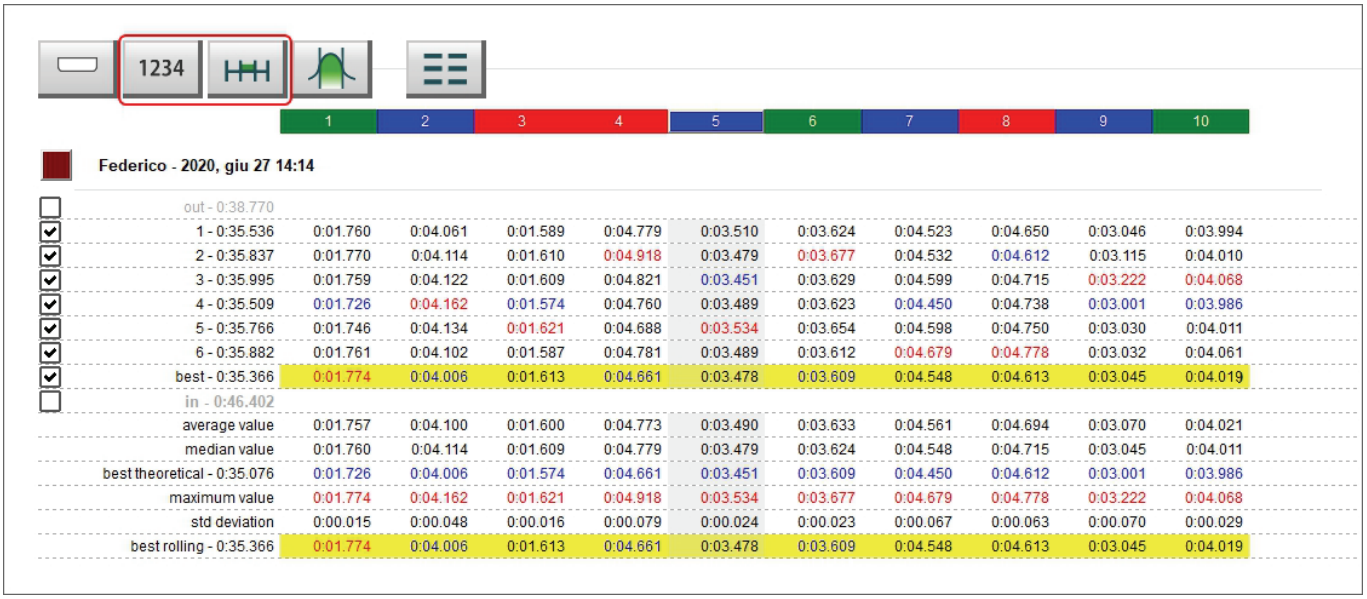
Best rolling: is the best lap time really made also if the splits belong to different laps assumed that they are successive



	1	2	3	4	5	6	7	8	9	10
Federico - 2020, giu 27 12:13										
out - 0:38.851										
1 - 0:35.938	0:01.785	0:04.119	0:01.639	0:04.878	0:03.628	0:03.589	0:04.580	0:04.620	0:03.084	0:04.016
best - 0:35.564	0:01.759	0:04.063	0:01.607	0:04.808	0:03.443	0:03.580	0:04.621	0:04.633	0:03.085	0:03.965
3 - 0:35.897	0:01.740	0:04.108	0:01.618	0:04.724	0:03.538	0:03.621	0:04.597	0:04.649	0:03.186	0:04.116
4 - 0:36.167	0:01.792	0:04.204	0:01.695	0:04.773	0:03.455	0:03.649	0:04.763	0:04.713	0:03.107	0:04.016
5 - 0:36.233	0:01.748	0:04.155	0:01.638	0:04.865	0:03.543	0:03.620	0:04.701	0:04.772	0:03.164	0:04.027
6 - 0:35.746	0:01.772	0:04.068	0:01.599	0:04.745	0:03.518	0:03.608	0:04.576	0:04.630	0:03.167	0:04.063
7 - 0:35.817	0:01.759	0:04.102	0:01.586	0:04.697	0:03.497	0:03.624	0:04.686	0:04.741	0:03.094	0:04.031
in - 0:51.868										
average value	0:01.765	0:04.117	0:01.626	0:04.784	0:03.517	0:03.613	0:04.646	0:04.680	0:03.127	0:04.033
median value	0:01.759	0:04.108	0:01.618	0:04.773	0:03.518	0:03.620	0:04.621	0:04.649	0:03.107	0:04.027
best theoretical - 0:35.354	0:01.740	0:04.063	0:01.586	0:04.697	0:03.443	0:03.580	0:04.576	0:04.620	0:03.084	0:03.965
maximum value	0:01.792	0:04.204	0:01.695	0:04.878	0:03.628	0:03.649	0:04.763	0:04.772	0:03.186	0:04.116
std deviation	0:00.018	0:00.046	0:00.033	0:00.064	0:00.058	0:00.021	0:00.066	0:00.057	0:00.041	0:00.043
best rolling - 0:35.517	0:01.740	0:04.108	0:01.618	0:04.724	0:03.443	0:03.580	0:04.621	0:04.633	0:03.085	0:03.965

9.3 – Absolute fractional mode

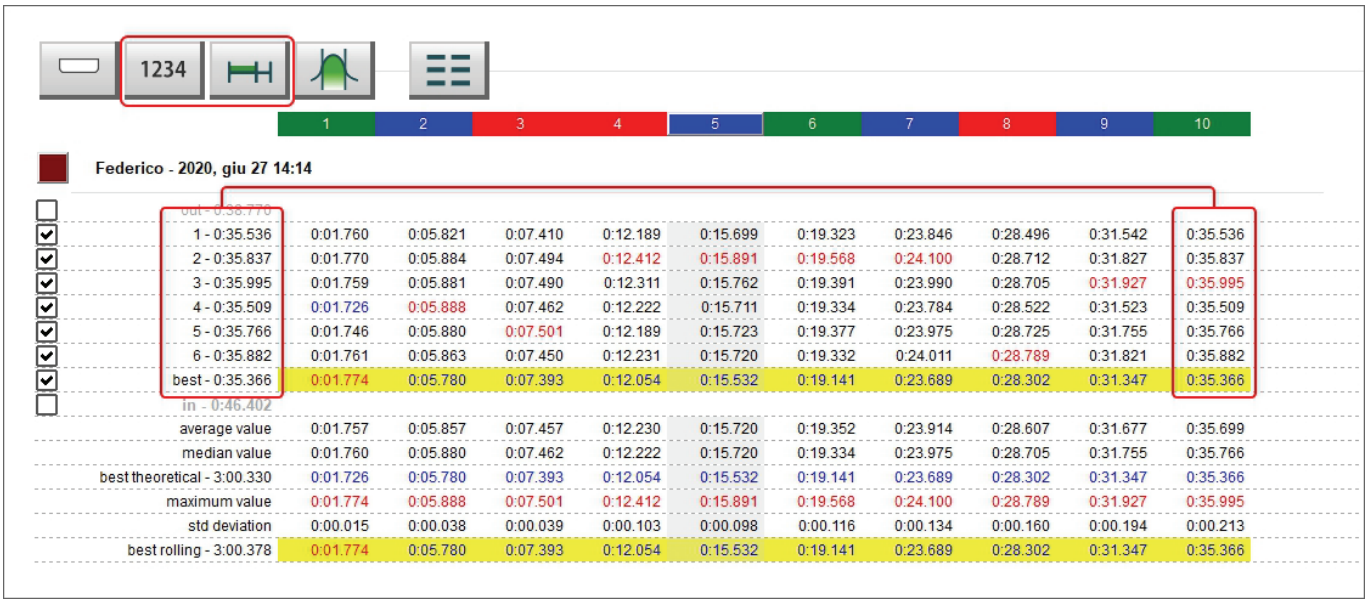
It shows all split times with lap time on the left of the row.



out - 0:38.770										
1 - 0:35.536	0:01.760	0:04.061	0:01.589	0:04.779	0:03.510	0:03.624	0:04.523	0:04.650	0:03.046	0:03.994
2 - 0:35.837	0:01.770	0:04.114	0:01.610	0:04.918	0:03.479	0:03.677	0:04.532	0:04.612	0:03.115	0:04.010
3 - 0:35.995	0:01.759	0:04.122	0:01.609	0:04.821	0:03.451	0:03.629	0:04.599	0:04.715	0:03.222	0:04.068
4 - 0:35.509	0:01.726	0:04.162	0:01.574	0:04.760	0:03.489	0:03.623	0:04.450	0:04.738	0:03.001	0:03.986
5 - 0:35.766	0:01.746	0:04.134	0:01.621	0:04.688	0:03.534	0:03.654	0:04.598	0:04.750	0:03.030	0:04.011
6 - 0:35.882	0:01.761	0:04.102	0:01.587	0:04.781	0:03.489	0:03.612	0:04.679	0:04.778	0:03.032	0:04.061
best - 0:35.366	0:01.774	0:04.006	0:01.613	0:04.661	0:03.478	0:03.609	0:04.548	0:04.613	0:03.045	0:04.019
in - 0:46.402										
average value	0:01.757	0:04.100	0:01.600	0:04.773	0:03.490	0:03.633	0:04.561	0:04.694	0:03.070	0:04.021
median value	0:01.760	0:04.114	0:01.609	0:04.779	0:03.479	0:03.624	0:04.548	0:04.715	0:03.045	0:04.011
best theoretical - 0:35.076	0:01.726	0:04.006	0:01.574	0:04.661	0:03.451	0:03.609	0:04.450	0:04.612	0:03.001	0:03.986
maximum value	0:01.774	0:04.162	0:01.621	0:04.918	0:03.534	0:03.677	0:04.679	0:04.778	0:03.222	0:04.068
std deviation	0:00.015	0:00.048	0:00.016	0:00.079	0:00.024	0:00.023	0:00.067	0:00.063	0:00.070	0:00.029
best rolling - 0:35.366	0:01.774	0:04.006	0:01.613	0:04.661	0:03.478	0:03.609	0:04.548	0:04.613	0:03.045	0:04.019

9.4 – Absolute cumulative mode

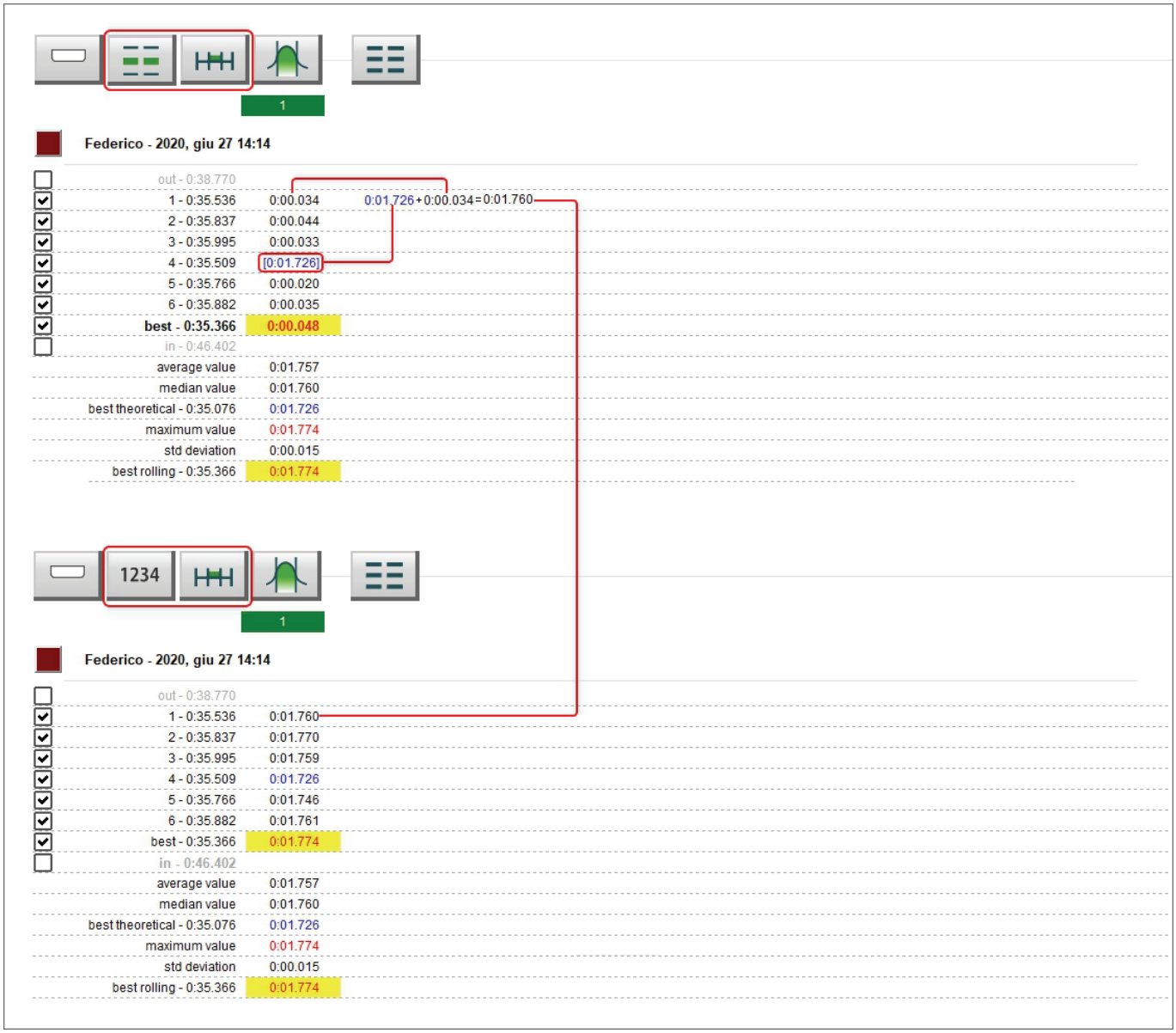
Each split time is added to the previous split time; the last split time is the lap time.



out - 0:38.770										
1 - 0:35.536	0:01.760	0:05.821	0:07.410	0:12.189	0:15.699	0:19.323	0:23.846	0:28.496	0:31.542	0:35.536
2 - 0:35.837	0:01.770	0:05.884	0:07.494	0:12.412	0:15.891	0:19.568	0:24.100	0:28.712	0:31.827	0:35.837
3 - 0:35.995	0:01.759	0:05.881	0:07.490	0:12.311	0:15.762	0:19.391	0:23.990	0:28.705	0:31.927	0:35.995
4 - 0:35.509	0:01.726	0:05.888	0:07.462	0:12.222	0:15.711	0:19.334	0:23.784	0:28.522	0:31.523	0:35.509
5 - 0:35.766	0:01.746	0:05.880	0:07.501	0:12.189	0:15.723	0:19.377	0:23.975	0:28.725	0:31.755	0:35.766
6 - 0:35.882	0:01.761	0:05.863	0:07.450	0:12.231	0:15.720	0:19.332	0:24.011	0:28.789	0:31.821	0:35.882
best - 0:35.366	0:01.774	0:05.780	0:07.393	0:12.054	0:15.532	0:19.141	0:23.689	0:28.302	0:31.347	0:35.366
in - 0:46.402										
average value	0:01.757	0:05.857	0:07.457	0:12.230	0:15.720	0:19.352	0:23.914	0:28.607	0:31.677	0:35.699
median value	0:01.760	0:05.880	0:07.462	0:12.222	0:15.720	0:19.334	0:23.975	0:28.705	0:31.755	0:35.766
best theoretical - 3:00.330	0:01.726	0:05.780	0:07.393	0:12.054	0:15.532	0:19.141	0:23.689	0:28.302	0:31.347	0:35.366
maximum value	0:01.774	0:05.888	0:07.501	0:12.412	0:15.891	0:19.568	0:24.100	0:28.789	0:31.927	0:35.995
std deviation	0:00.015	0:00.038	0:00.039	0:00.103	0:00.098	0:00.116	0:00.134	0:00.160	0:00.194	0:00.213
best rolling - 3:00.378	0:01.774	0:05.780	0:07.393	0:12.054	0:15.532	0:19.141	0:23.689	0:28.302	0:31.347	0:35.366

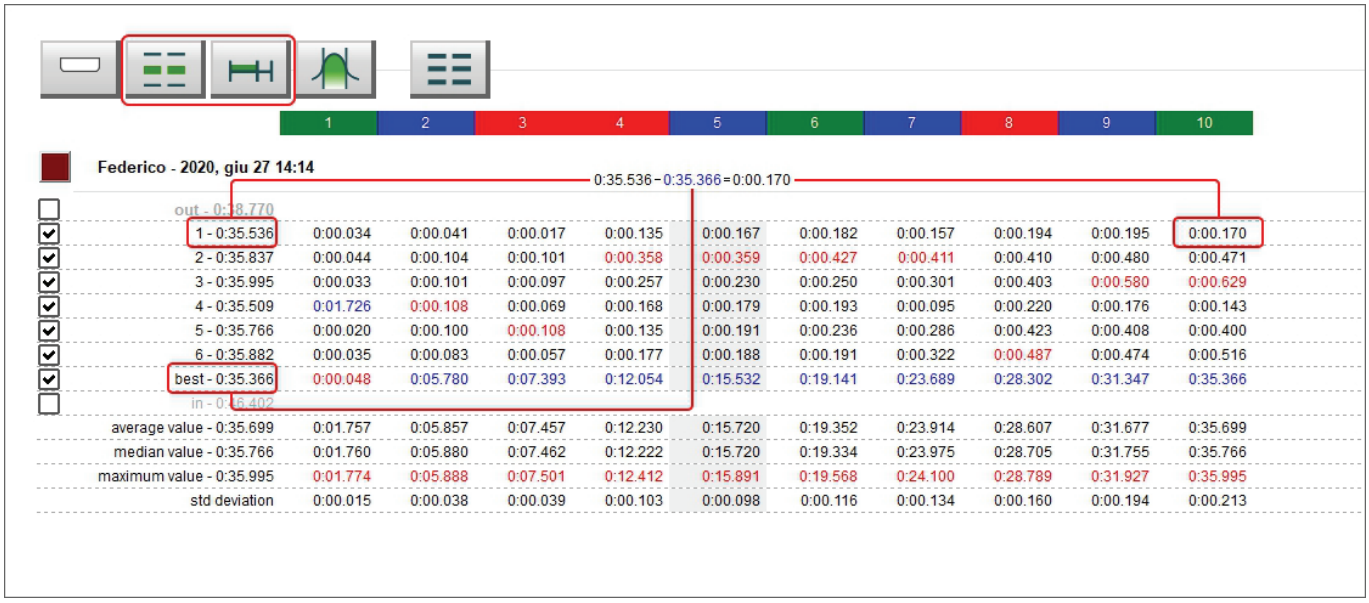
9.5 – Refer to best split fractional mode

Shows for each split the difference between the current split time and the best time recorded for this split in the session. As shown here below the best split time of the current split is highlighted in blue; adding it to the best time of this split you have the split time of the current split.



9.6 – Refer to best split cumulative mode

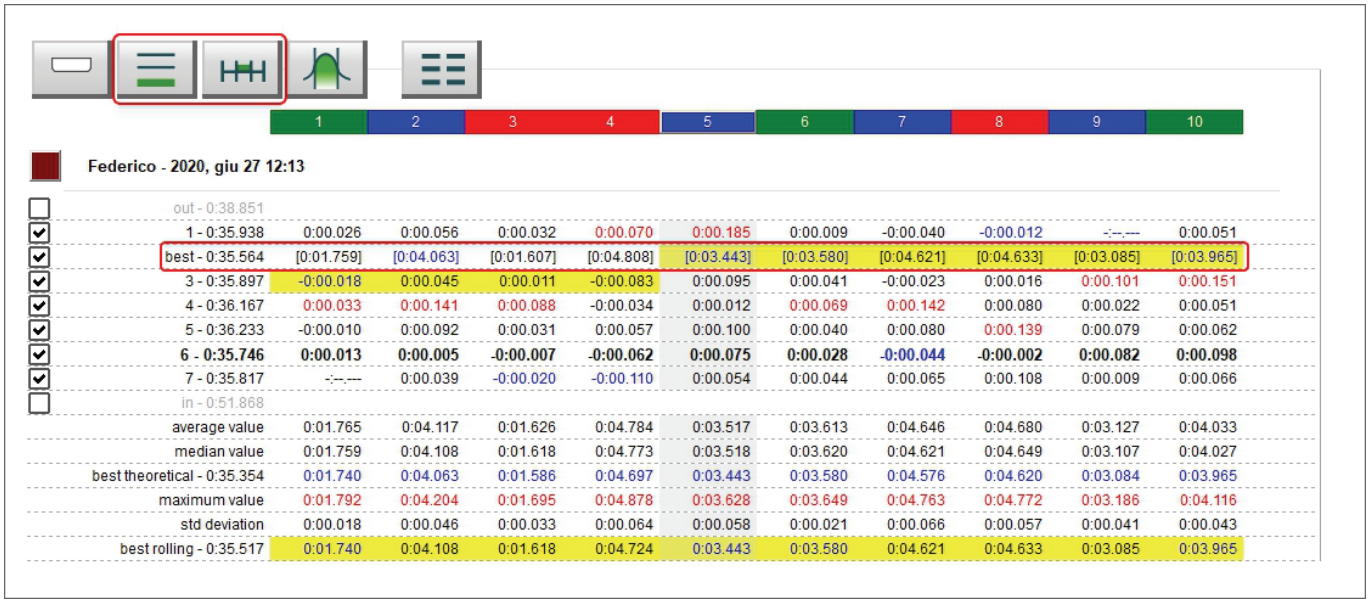
The difference between the current split time and the time reached at the current split in the best lap. The last split of the current lap shows the difference between the current lap time and the best lap time.



out - 0:38.770											
1 - 0:35.536	0:00.034	0:00.041	0:00.017	0:00.135	0:00.167	0:00.182	0:00.157	0:00.194	0:00.195	0:00.170
2 - 0:35.837	0:00.044	0:00.104	0:00.101	0:00.358	0:00.359	0:00.427	0:00.411	0:00.410	0:00.480	0:00.471
3 - 0:35.995	0:00.033	0:00.101	0:00.097	0:00.257	0:00.230	0:00.250	0:00.301	0:00.403	0:00.580	0:00.629
4 - 0:35.509	0:01.726	0:00.108	0:00.069	0:00.168	0:00.179	0:00.193	0:00.095	0:00.220	0:00.176	0:00.143
5 - 0:35.766	0:00.020	0:00.100	0:00.108	0:00.135	0:00.191	0:00.236	0:00.286	0:00.423	0:00.408	0:00.400
6 - 0:35.882	0:00.035	0:00.083	0:00.057	0:00.177	0:00.188	0:00.191	0:00.322	0:00.487	0:00.474	0:00.516
best - 0:35.366	0:00.048	0:05.780	0:07.393	0:12.054	0:15.532	0:19.141	0:23.689	0:28.302	0:31.347	0:35.366
in - 0:36.402										
average value - 0:35.699	0:01.757	0:05.857	0:07.457	0:12.230	0:15.720	0:19.352	0:23.914	0:28.607	0:31.677	0:35.699
median value - 0:35.766	0:01.760	0:05.880	0:07.462	0:12.222	0:15.720	0:19.334	0:23.975	0:28.705	0:31.755	0:35.766
maximum value - 0:35.995	0:01.774	0:05.888	0:07.501	0:12.412	0:15.891	0:19.568	0:24.100	0:28.789	0:31.927	0:35.995
std deviation	0:00.015	0:00.038	0:00.039	0:00.103	0:00.098	0:00.116	0:00.134	0:00.160	0:00.194	0:00.213

9.7 – Refer to best lap fractional mode

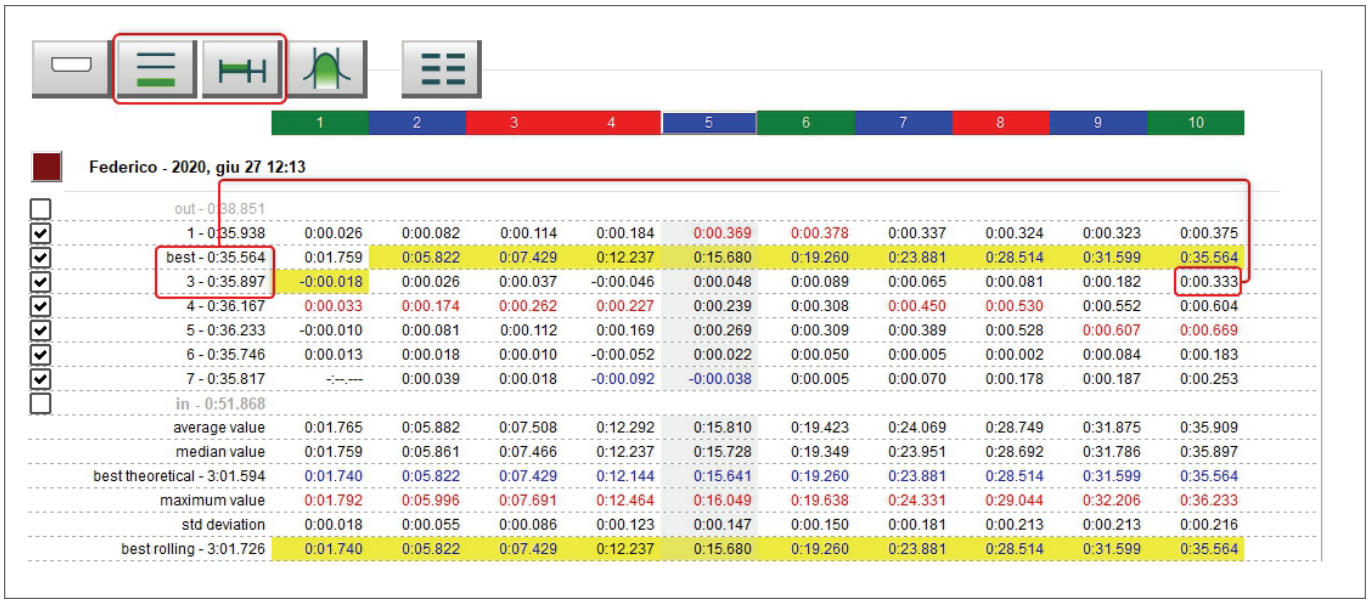
It shows the difference between the current split time and the time of the same split in best lap. Best lap time splits are shown in a square parenthesis on the related row (highlighted in the image below).



out - 0:38.851										
1 - 0:35.938	0:00.026	0:00.056	0:00.032	0:00.070	0:00.185	0:00.009	-0:00.040	-0:00.012	-:--.---	0:00.051
best - 0:35.564	[0:01.759]	[0:04.063]	[0:01.607]	[0:04.808]	[0:03.443]	[0:03.580]	[0:04.621]	[0:04.633]	[0:03.085]	[0:03.965]
3 - 0:35.897	-0:00.018	0:00.045	0:00.011	-0:00.083	0:00.095	0:00.041	-0:00.023	0:00.016	0:00.101	0:00.151
4 - 0:36.167	0:00.033	0:00.141	0:00.088	-0:00.034	0:00.012	0:00.069	0:00.142	0:00.080	0:00.022	0:00.051
5 - 0:36.233	-0:00.010	0:00.092	0:00.031	0:00.057	0:00.100	0:00.040	0:00.080	0:00.139	0:00.079	0:00.062
6 - 0:35.746	**0:00.013**	**0:00.005**	**-0:00.007**	**-0:00.062**	**0:00.075**	**0:00.028**	**-0:00.044**	**-0:00.002**	**0:00.082**	**0:00.098**
7 - 0:35.817	-:--.---	0:00.039	-0:00.020	-0:00.110	0:00.054	0:00.044	0:00.065	0:00.108	0:00.009	0:00.066
in - 0:51.868										
average value	0:01.765	0:04.117	0:01.626	0:04.784	0:03.517	0:03.613	0:04.646	0:04.680	0:03.127	0:04.033
median value	0:01.759	0:04.108	0:01.618	0:04.773	0:03.518	0:03.620	0:04.621	0:04.649	0:03.107	0:04.027
best theoretical - 0:35.354	0:01.740	0:04.063	0:01.586	0:04.697	0:03.443	0:03.580	0:04.576	0:04.620	0:03.084	0:03.965
maximum value	0:01.792	0:04.204	0:01.695	0:04.878	0:03.628	0:03.649	0:04.763	0:04.772	0:03.186	0:04.116
std deviation	0:00.018	0:00.046	0:00.033	0:00.064	0:00.058	0:00.021	0:00.066	0:00.057	0:00.041	0:00.043
best rolling - 0:35.517	0:01.740	0:04.108	0:01.618	0:04.724	0:03.443	0:03.580	0:04.621	0:04.633	0:03.085	0:03.965

9.8 – Refer to best lap cumulative mode

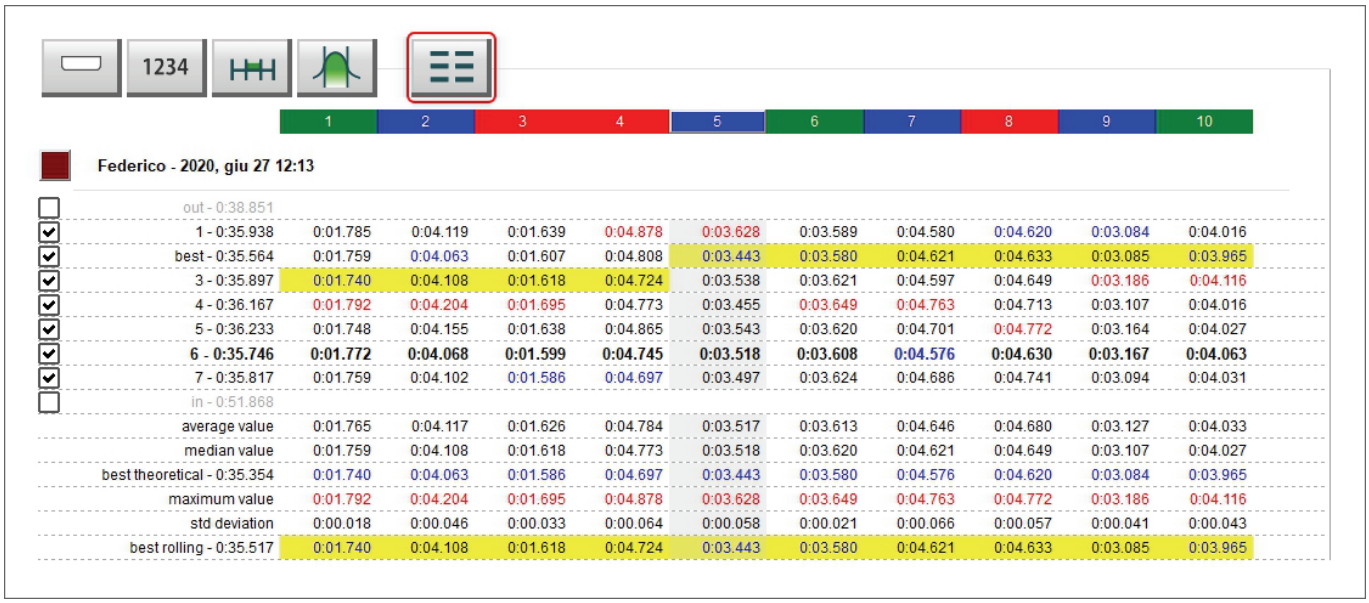
The difference between the current split time and the split time of the same split in best lap time is added to the difference between the following split time and the split time of that split in best lap time. The last split time is the difference between the current lap time and best lap time.



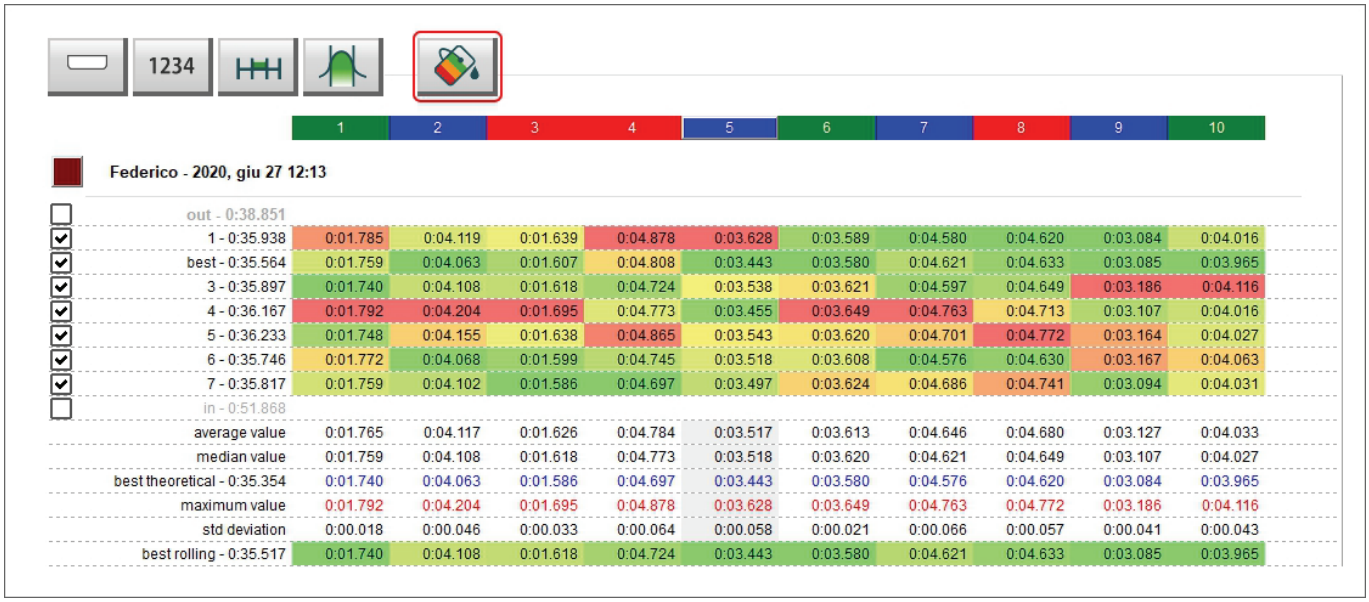
	1	2	3	4	5	6	7	8	9	10
Federico - 2020, giu 27 12:13										
out - 0:38.851										
1 - 0:35.938	0:00.026	0:00.082	0:00.114	0:00.184	0:00.369	0:00.378	0:00.337	0:00.324	0:00.323	0:00.375
best - 0:35.564	0:01.759	0:05.822	0:07.429	0:12.237	0:15.680	0:19.260	0:23.881	0:28.514	0:31.599	0:35.564
3 - 0:35.897	-0:00.018	0:00.026	0:00.037	-0:00.046	0:00.048	0:00.089	0:00.065	0:00.081	0:00.182	0:00.333
4 - 0:36.167	0:00.033	0:00.174	0:00.262	0:00.227	0:00.239	0:00.308	0:00.450	0:00.530	0:00.552	0:00.604
5 - 0:36.233	-0:00.010	0:00.081	0:00.112	0:00.169	0:00.269	0:00.309	0:00.389	0:00.528	0:00.607	0:00.669
6 - 0:35.746	0:00.013	0:00.018	0:00.010	-0:00.052	0:00.022	0:00.050	0:00.005	0:00.002	0:00.084	0:00.183
7 - 0:35.817	-:--.---	0:00.039	0:00.018	-0:00.092	-0:00.038	0:00.005	0:00.070	0:00.178	0:00.187	0:00.253
in - 0:51.868										
average value	0:01.765	0:05.882	0:07.508	0:12.292	0:15.810	0:19.423	0:24.069	0:28.749	0:31.875	0:35.909
median value	0:01.759	0:05.861	0:07.466	0:12.237	0:15.728	0:19.349	0:23.951	0:28.692	0:31.786	0:35.897
best theoretical - 3:01.594	0:01.740	0:05.822	0:07.429	0:12.144	0:15.641	0:19.260	0:23.881	0:28.514	0:31.599	0:35.564
maximum value	0:01.792	0:05.996	0:07.691	0:12.464	0:16.049	0:19.638	0:24.331	0:29.044	0:32.206	0:36.233
std deviation	0:00.018	0:00.055	0:00.086	0:00.123	0:00.147	0:00.150	0:00.181	0:00.213	0:00.213	0:00.216
best rolling - 3:01.726	0:01.740	0:05.822	0:07.429	0:12.237	0:15.680	0:19.260	0:23.881	0:28.514	0:31.599	0:35.564

9.9 – Classic/Colorize layout

Default layout is **Classic**: white background with best rolling lap highlighted in yellow (top image below).
If you **Colorize** it the cells will have coloured background that go from green for good values to red for bad values (bottom image below).



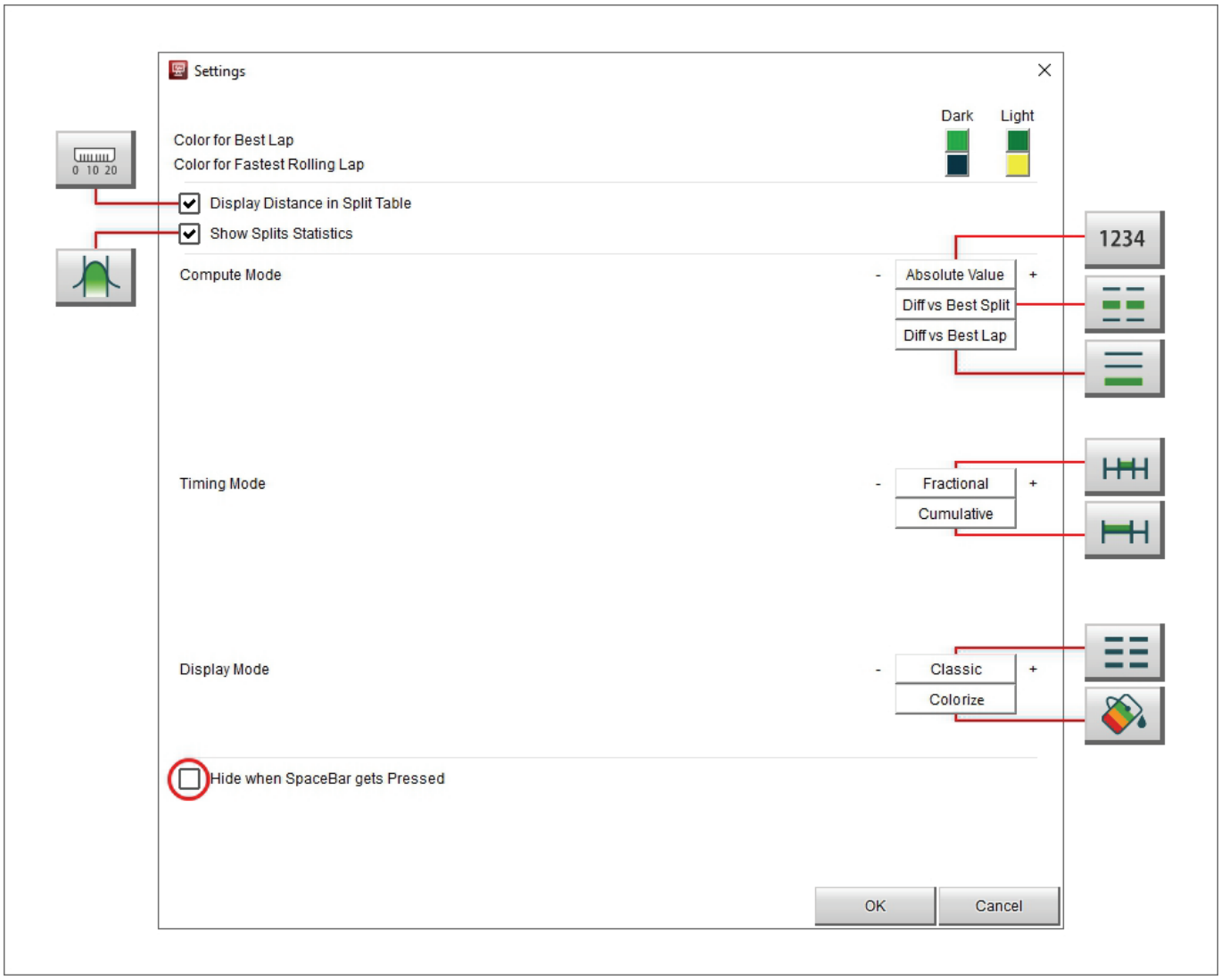
	1	2	3	4	5	6	7	8	9	10
Federico - 2020, giu 27 12:13										
out - 0:38.851										
1 - 0:35.938	0:01.785	0:04.119	0:01.639	0:04.878	0:03.628	0:03.589	0:04.580	0:04.620	0:03.084	0:04.016
best - 0:35.564	0:01.759	0:04.063	0:01.607	0:04.808	0:03.443	0:03.580	0:04.621	0:04.633	0:03.085	0:03.965
3 - 0:35.897	0:01.740	0:04.108	0:01.618	0:04.724	0:03.538	0:03.621	0:04.597	0:04.649	0:03.186	0:04.116
4 - 0:36.167	0:01.792	0:04.204	0:01.695	0:04.773	0:03.455	0:03.649	0:04.763	0:04.713	0:03.107	0:04.016
5 - 0:36.233	0:01.748	0:04.155	0:01.638	0:04.865	0:03.543	0:03.620	0:04.701	0:04.772	0:03.164	0:04.027
6 - 0:35.746	**0:01.772**	**0:04.068**	**0:01.599**	**0:04.745**	**0:03.518**	**0:03.608**	**0:04.576**	**0:04.630**	**0:03.167**	**0:04.063**
7 - 0:35.817	0:01.759	0:04.102	0:01.586	0:04.697	0:03.497	0:03.624	0:04.686	0:04.741	0:03.094	0:04.031
in - 0:51.868										
average value	0:01.765	0:04.117	0:01.626	0:04.784	0:03.517	0:03.613	0:04.646	0:04.680	0:03.127	0:04.033
median value	0:01.759	0:04.108	0:01.618	0:04.773	0:03.518	0:03.620	0:04.621	0:04.649	0:03.107	0:04.027
best theoretical - 0:35.354	0:01.740	0:04.063	0:01.586	0:04.697	0:03.443	0:03.580	0:04.576	0:04.620	0:03.084	0:03.965
maximum value	0:01.792	0:04.204	0:01.695	0:04.878	0:03.628	0:03.649	0:04.763	0:04.772	0:03.186	0:04.116
std deviation	0:00.018	0:00.046	0:00.033	0:00.064	0:00.058	0:00.021	0:00.066	0:00.057	0:00.041	0:00.043
best rolling - 0:35.517	0:01.740	0:04.108	0:01.618	0:04.724	0:03.443	0:03.580	0:04.621	0:04.633	0:03.085	0:03.965



	1	2	3	4	5	6	7	8	9	10
Federico - 2020, giu 27 12:13										
out - 0:38.851										
1 - 0:35.938	0:01.785	0:04.119	0:01.639	0:04.878	0:03.628	0:03.589	0:04.580	0:04.620	0:03.084	0:04.016
best - 0:35.564	0:01.759	0:04.063	0:01.607	0:04.808	0:03.443	0:03.580	0:04.621	0:04.633	0:03.085	0:03.965
3 - 0:35.897	0:01.740	0:04.108	0:01.618	0:04.724	0:03.538	0:03.621	0:04.597	0:04.649	0:03.186	0:04.116
4 - 0:36.167	0:01.792	0:04.204	0:01.695	0:04.773	0:03.455	0:03.649	0:04.763	0:04.713	0:03.107	0:04.016
5 - 0:36.233	0:01.748	0:04.155	0:01.638	0:04.865	0:03.543	0:03.620	0:04.701	0:04.772	0:03.164	0:04.027
6 - 0:35.746	0:01.772	0:04.068	0:01.599	0:04.745	0:03.518	0:03.608	0:04.576	0:04.630	0:03.167	0:04.063
7 - 0:35.817	0:01.759	0:04.102	0:01.586	0:04.697	0:03.497	0:03.624	0:04.686	0:04.741	0:03.094	0:04.031
in - 0:51.868										
average value	0:01.765	0:04.117	0:01.626	0:04.784	0:03.517	0:03.613	0:04.646	0:04.680	0:03.127	0:04.033
median value	0:01.759	0:04.108	0:01.618	0:04.773	0:03.518	0:03.620	0:04.621	0:04.649	0:03.107	0:04.027
best theoretical - 0:35.354	0:01.740	0:04.063	0:01.586	0:04.697	0:03.443	0:03.580	0:04.576	0:04.620	0:03.084	0:03.965
maximum value	0:01.792	0:04.204	0:01.695	0:04.878	0:03.628	0:03.649	0:04.763	0:04.772	0:03.186	0:04.116
std deviation	0:00.018	0:00.046	0:00.033	0:00.064	0:00.058	0:00.021	0:00.066	0:00.057	0:00.041	0:00.043
best rolling - 0:35.517	0:01.740	0:04.108	0:01.618	0:04.724	0:03.443	0:03.580	0:04.621	0:04.633	0:03.085	0:03.965

9.10 – Settings dialog window

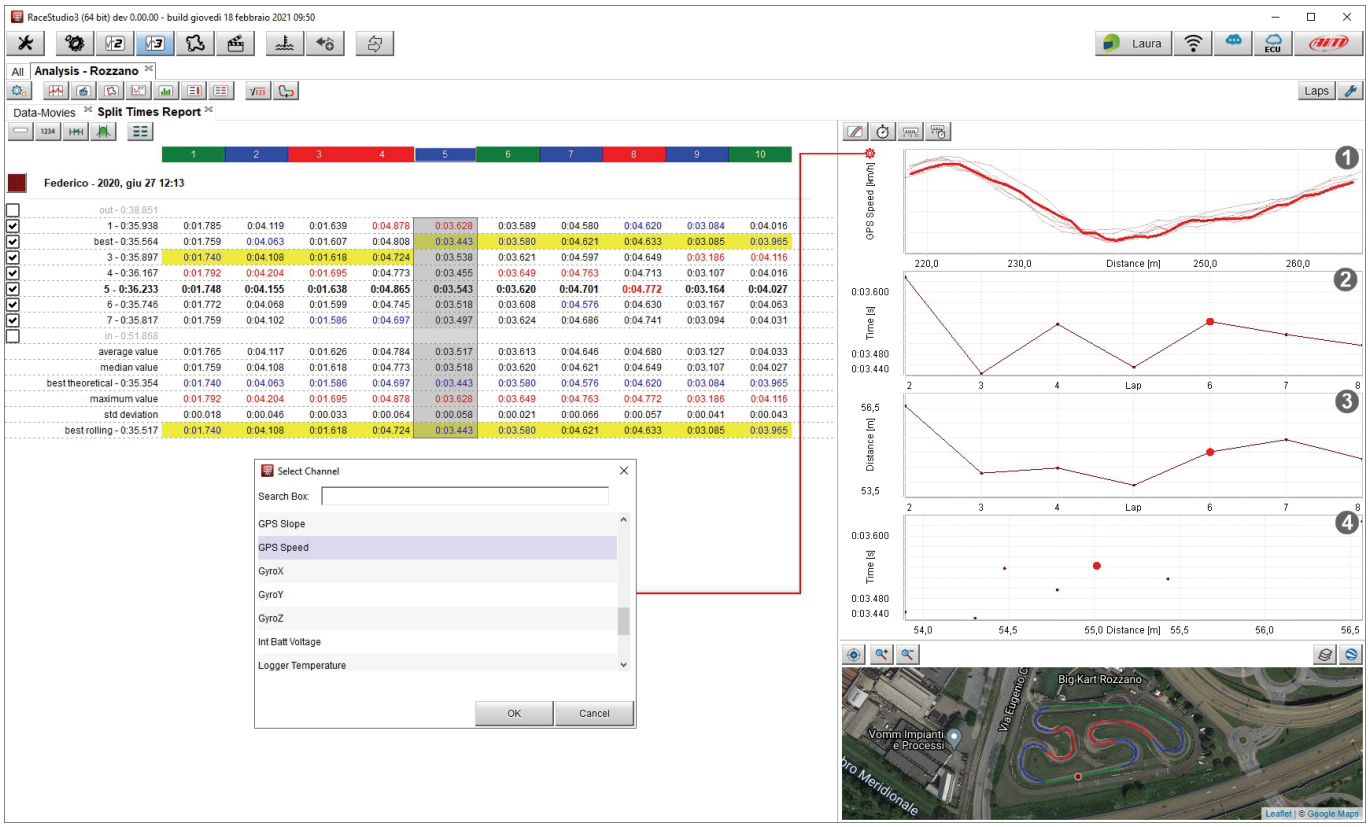
Right clicking on the central table “Setting” dialog window is prompted; it allows to perform the same operations performed through the top left keyboard as well as to hide the table when the Space Bar is pressed enabling the related bottom checkbox, highlighted here below.



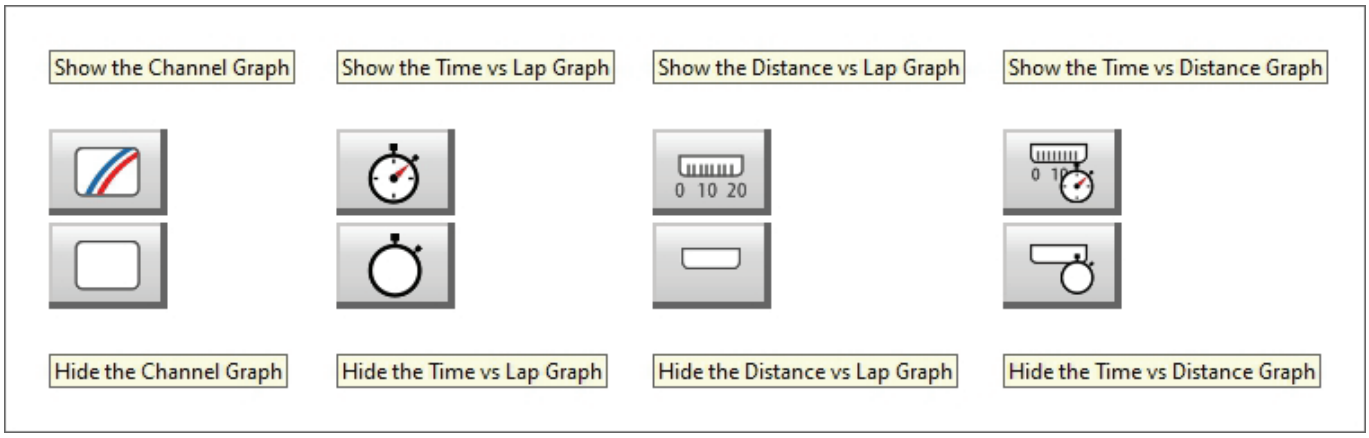
9.11 – Split graphs

Selecting any split column the split graphs appear right of the central table. They are:

- Custom channel (GPS Speed in the example below)/distance (**1**)
- Time/Lap (**2**)
- Distance/Lap (**3**)
- Time/Distance (**4**)



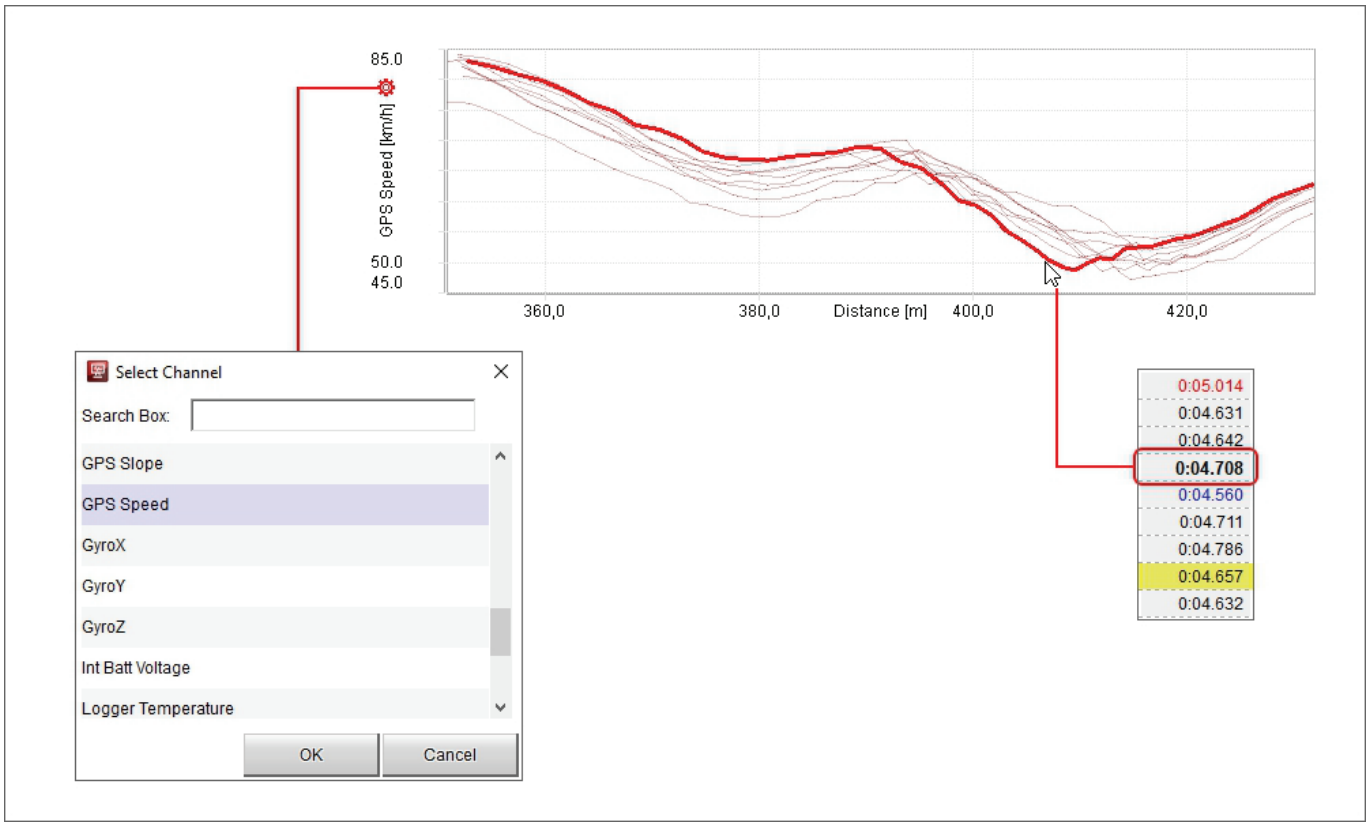
Each graph can be shown/hidden using the keyboard top left of the graphs.



9.11.1 – Channel graph

The first graph on top is a custom graph because you can choose the channel you want on "Y" axis. To do so:

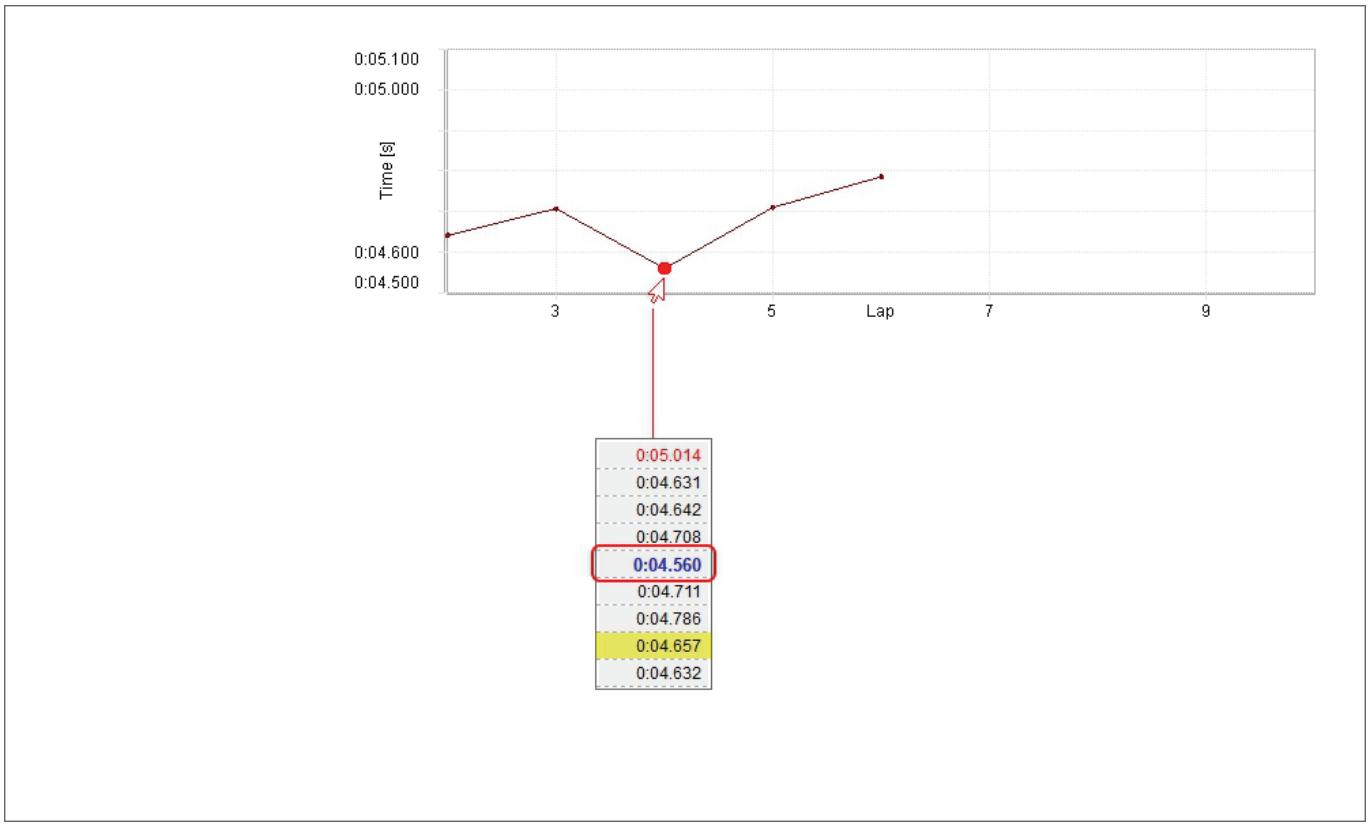
- click the setting icon
- "Select Channel" dialog window is prompted: scroll it or type the name of the channel you want to set on the ordinate axis and press "OK"; default channel is GPS Speed
- As shown here below, mousing over the graph the split you are mousing over becomes bold in the central table and vice-versa.



9.11.2 – Time/Lap (number) graph

The second graph from top is Time/Lap number. It shows:

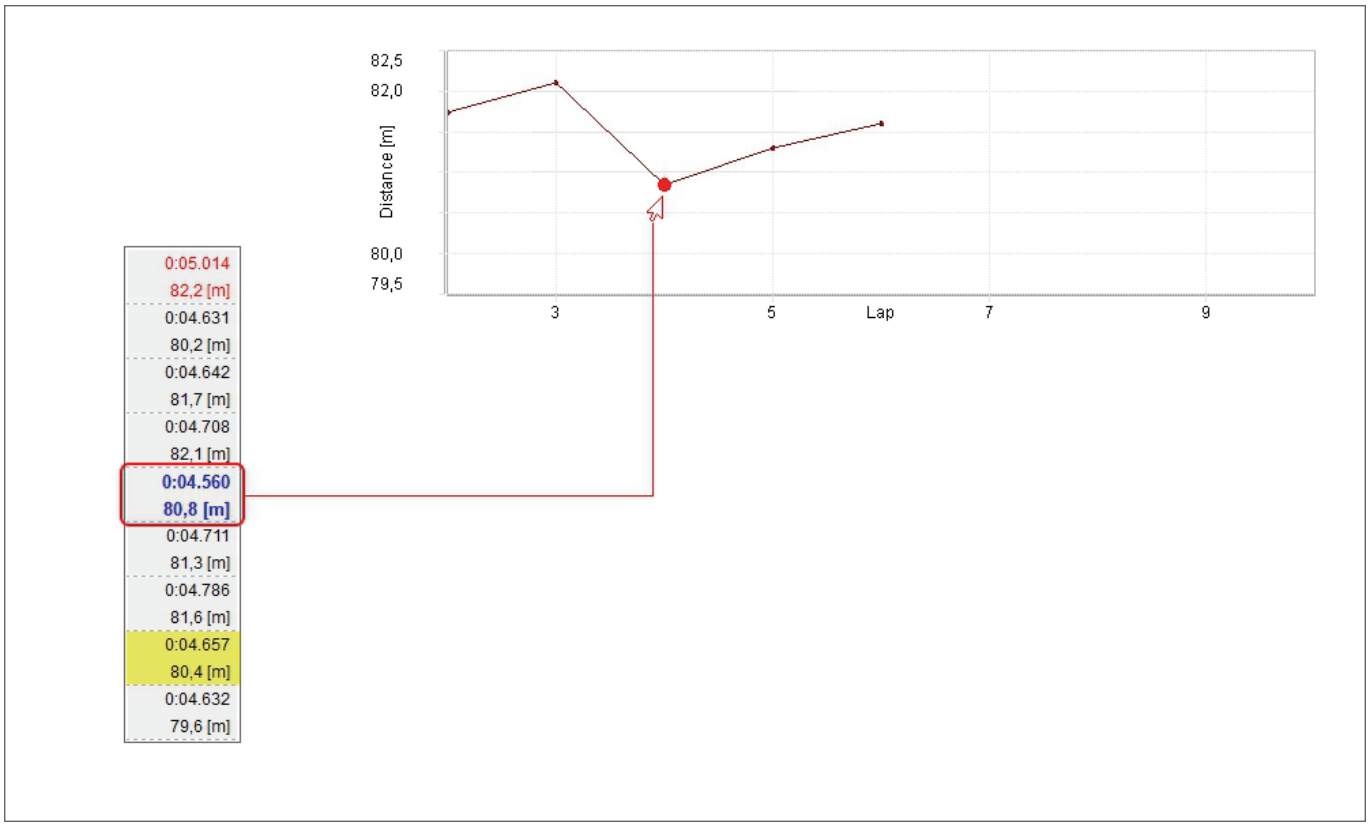
- Lap number on abscissa axis
- split time of the split in each lap on ordinate axis
- as shown here below, mousing over the selected split it becomes bold in the central table and vice versa.



9.11.3 – Distance/Lap number graph

The third graph from top is Distance/Lap number. It shows:

- Lap number on abscissa axis
- Run distance of the split in each lap on ordinate axis
- As shown here below, mousing over the graph the selected split it becomes bold in the central table and vice versa; it is suggested to keep "Distance" row activated (paragraph 9.1)

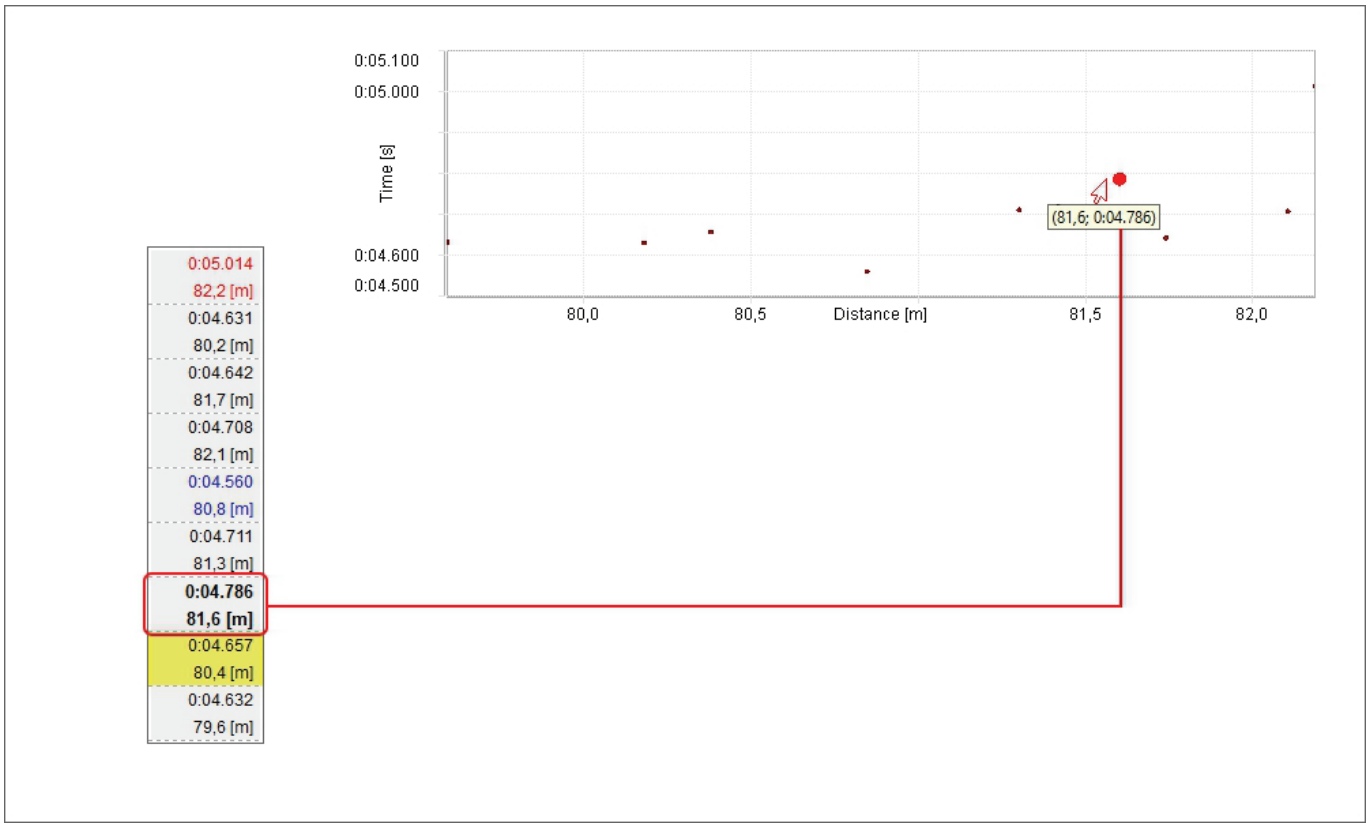


9.11.4 – Time/Distance graph

The bottom graph is Time/Distance and is a scatter graph. It shows:

- Run distance on abscissa axis
- Split time in each lap on ordinate axis
- As shown here below, mousing over the graph the selected split becomes bold in the central table and vice versa

This graph, linking the run distance with the split time is particularly useful to analyse the racer guide in cornering.



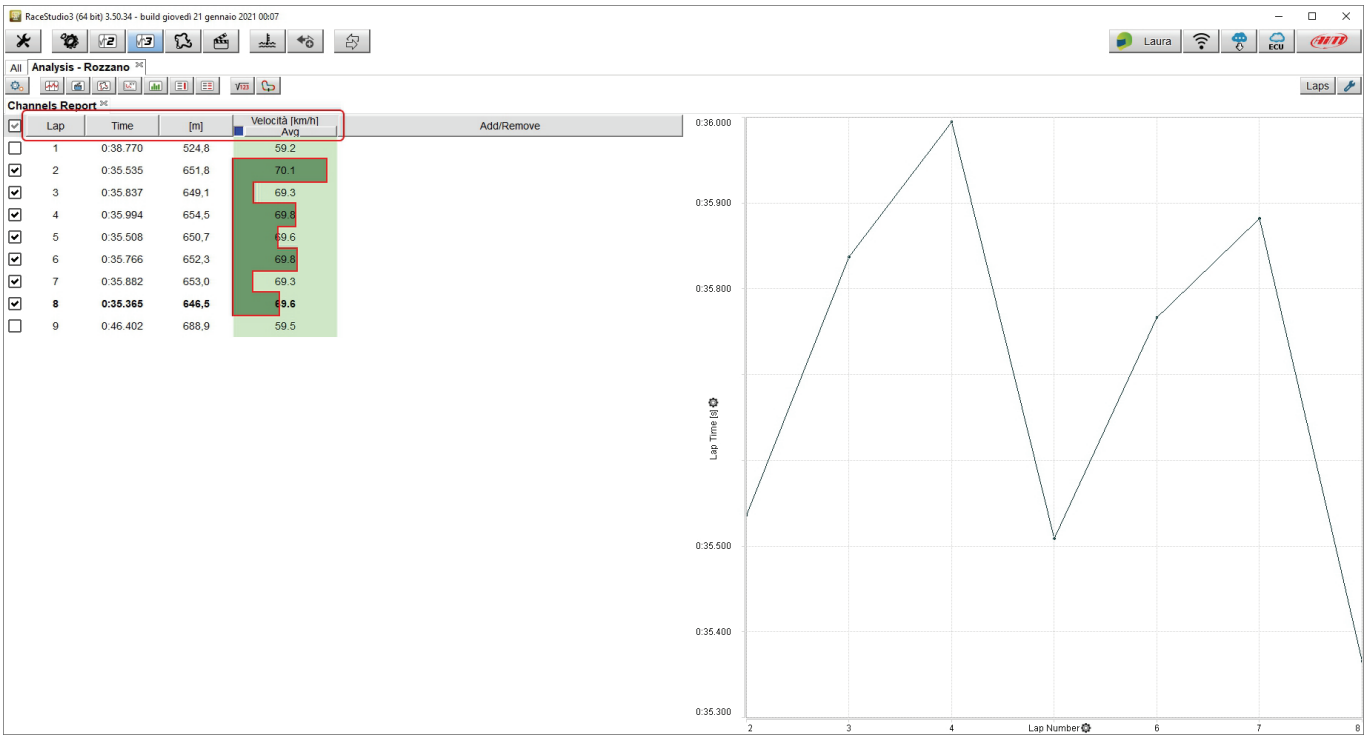
10 – Channels Report layout

This layout gives a macro-representation of calculation made on the channels so to have a quick view on each channel. The layout is made up of two parts: the values table on the left and the custom graph on the right.
This view is used to see these three main aspects:

- Vehicle health: mainly through temperatures, pressures and battery level
- Racer performances: mainly through average throttle opening, average steering angle value, average brake pressure (the racer inputs)
- Vehicle performance: mainly through longitudinal and lateral acceleration variations and max speed

With reference to the image below, clicking on the header of each column data can be sorted increasingly/decreasingly.
Columns can be added/removed except for the first three from the left. Default view of channels table includes from left to right:

- Lap number
- Lap time
- Run distance; the values of this column – except for these of the first and last lap – are obviously all very similar
- Average speed (this is the only default column that can be removed); clicking on the coloured checkbox left of the column header the background histogram of the column appears/disappears.



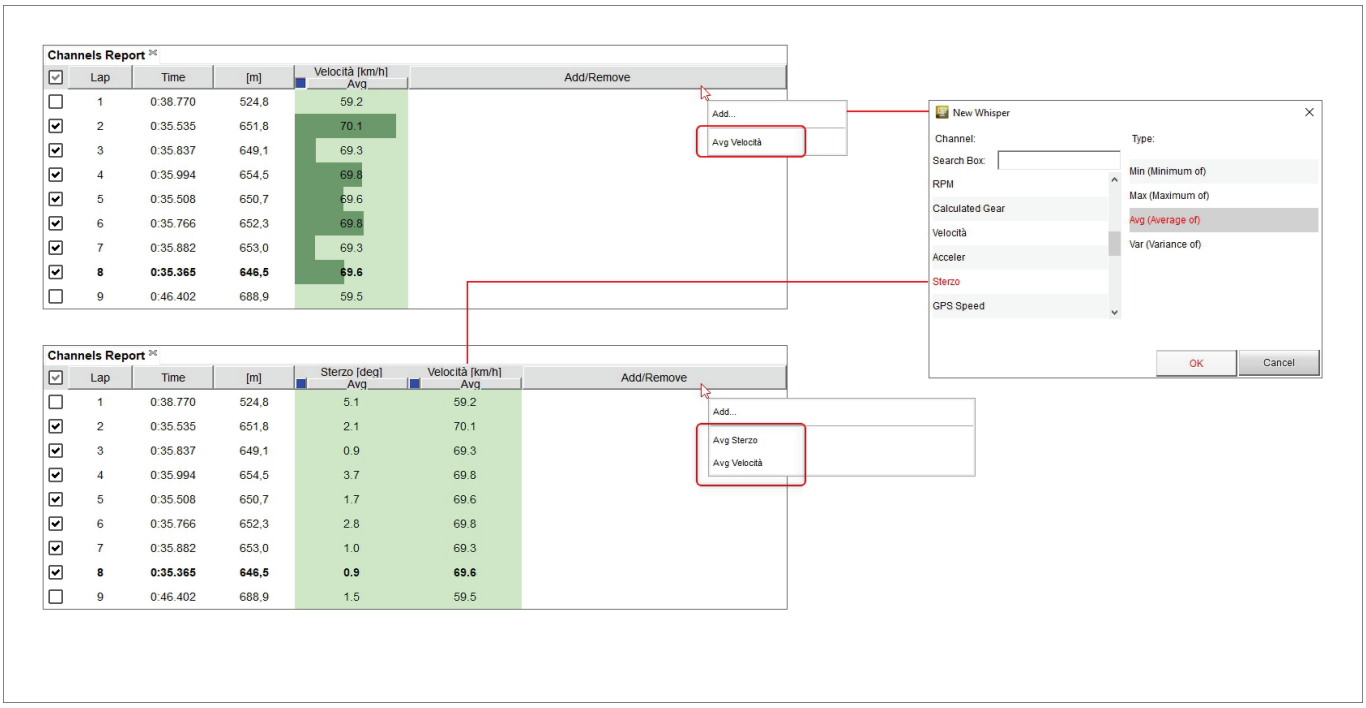
10.1 – The Channels table

Right of Channels report layout is channels table. As said, it has four default columns.
To **add a column:**

- click on "Add/Remove" header
- "Add/Remove" menu appears
- select "Add"
- a selection dialog window appears; here **you have to choose** not only the **channel** on the left part of the dialog window but also its **statistics** (min, max, average and standard deviation value) on the right
- click "OK"

To **remove a column:**

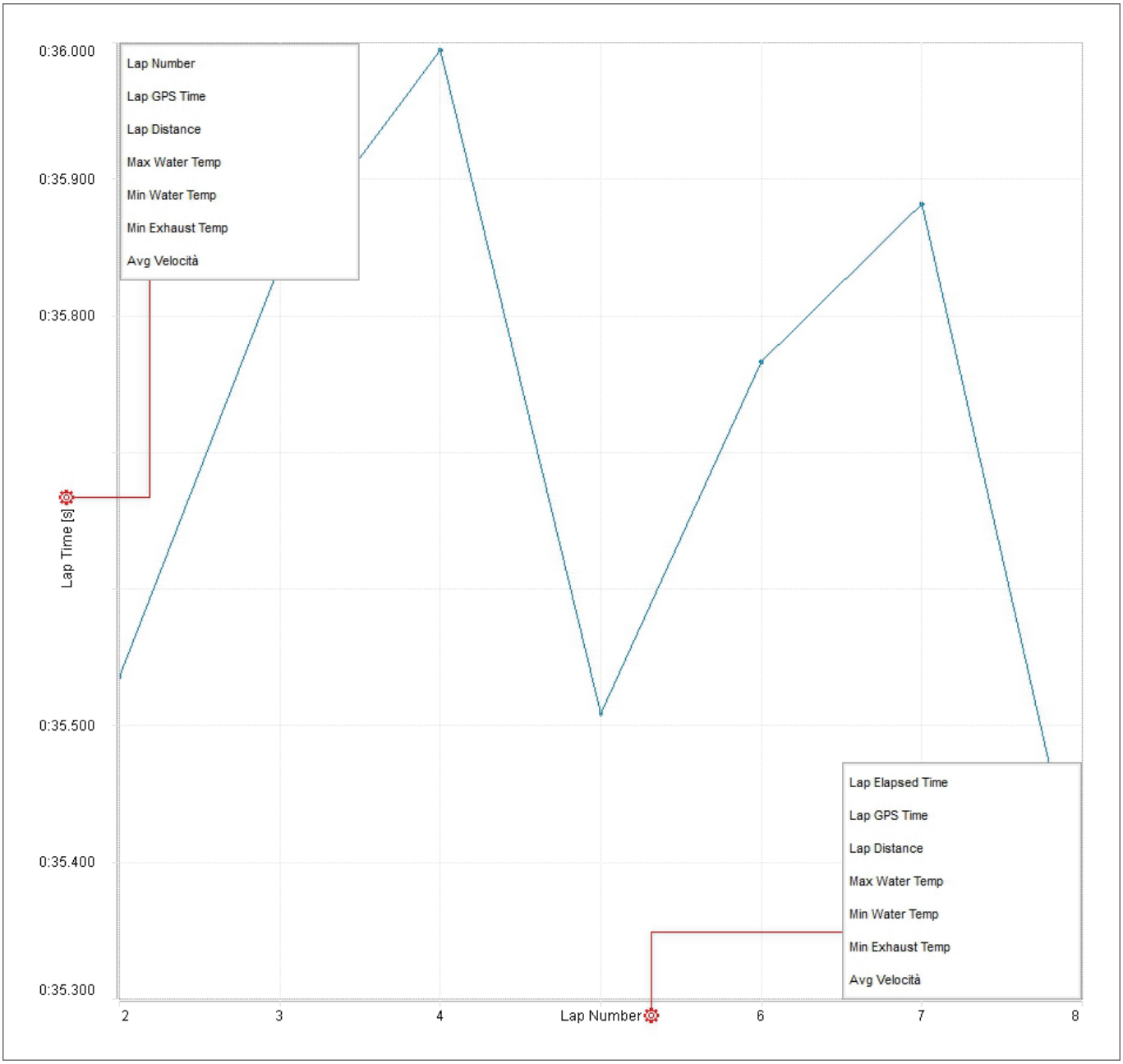
- click on "Add/Remove" header
- "Add/Remove" menu appears
- select the column to remove and it is removed.



10.2 – The custom graph

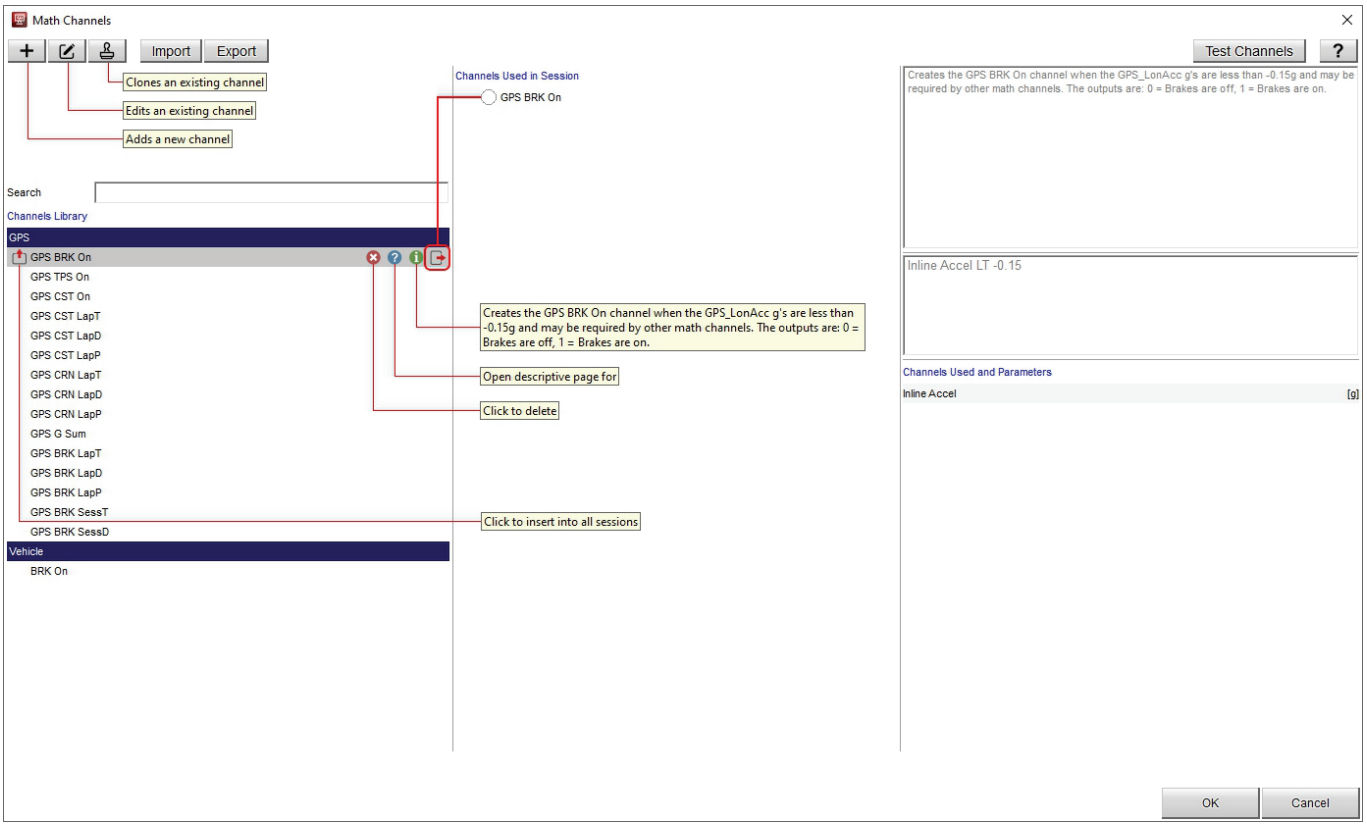
Right of "Channels Report" layout is a graph we will call "Custom" because channel on the abscissa axis and channel on the ordinate axis can be changed according to the user preferences.
Default graph shows Lap time on the ordinate axis and Lap Number on the abscissa axis. To change the channel on the axes:

- Click the setting icon of the axis to change
- Select the channel to be shown
- Click out of the menu



11 – Math channels

RS3Analysis software provides a default number of Math channels but allows the user to create custom ones too. This tool applies to all layouts. Math channels can also be imported/exported, added, modified, cloned and deleted using the top keyboard as shown below. Clicking the icon shown here above "Math channels" dialog window appears no matter which layout you are working on.



Using the top left keyboard you can:

- Add a new channel
- Edit an existing channel
- Clone an existing channel
- Import/export channels

Channels are grouped by type in the channels library left of the dialog window and using the search box it is possible to search for a channel in the library. The search box filters by channel name, measure unit, comment and description. **Please note**: switching from one measurement system to another the measure units are automatically converted by the software

Selecting any channel included in the channel library different icons appear; they are to:

Apply that math channel to all sessions

Delete a channel

Open the description page of the channel on the Internet

Show a short description of the channel

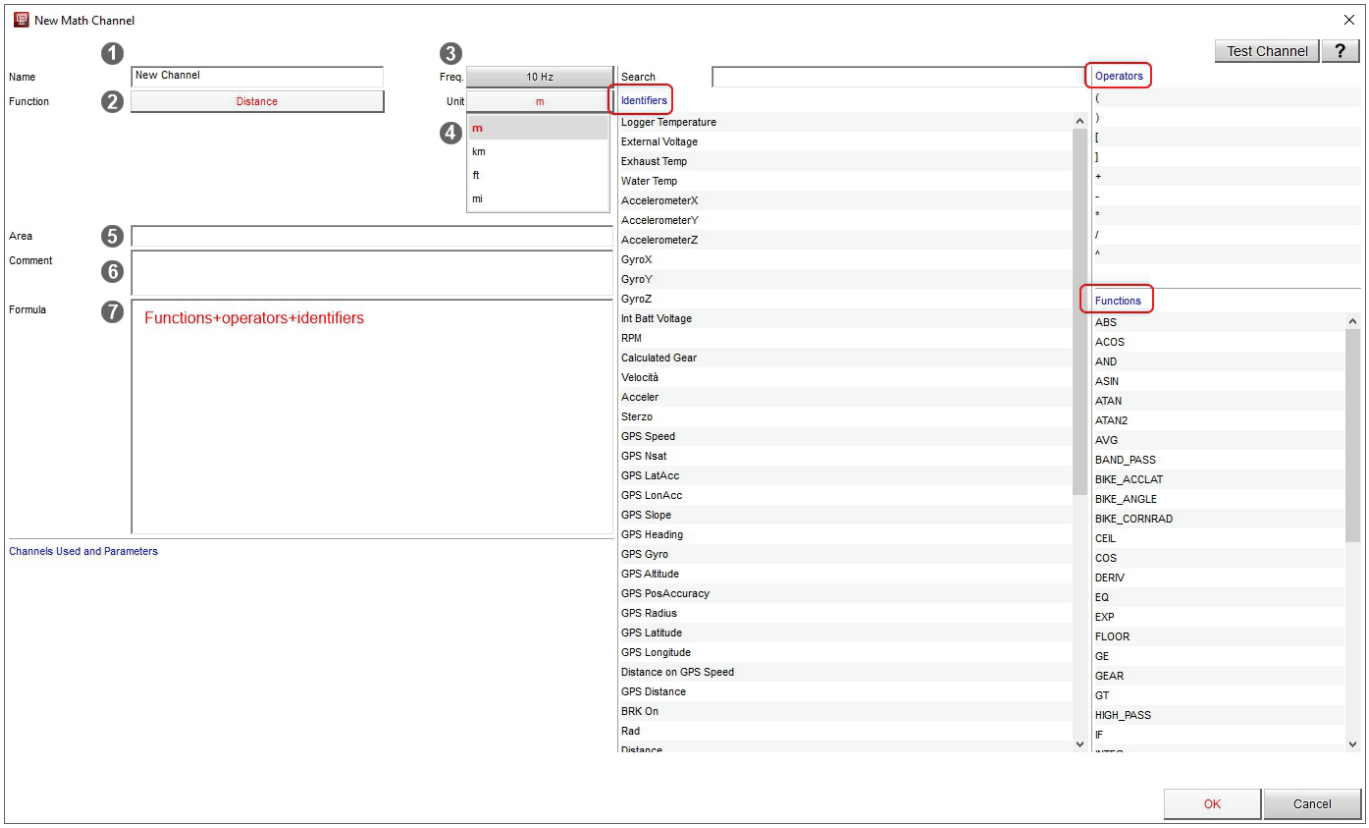
Apply the selected channel to the current session

In the central part of the dialog window are shown the channels applied to the current session.

The right part of the dialog window shows the channel description on top, the related math formula central and the channels used and its parameters bottom.

11.1 – How to add/edit a math channel

To add a new math channel press the buttons here above on the top left keyboard and this dialog window is prompted.



With reference to the image above:

- Choose a name for the math channel (**1**)
- Select a function and a function type when available (**2**)
- Select the sampling Frequency: available options are: 1 ,2, 5 and 10 Hz (**3**)
- Select the measure unit according to the function (**4**)
- Area: this field is used to collect channels in the main list of available channels (**5**)
- Comment: this will be shown in the channel description in the main list (**6**)
- Formula: the math expression that will be computed using functions, operators and identifiers(**7**); Identifiers change according to the channel names of the loaded tests while operators and functions never change