User Manual
Race Studio 3 Analysis

Release 1.01
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INDEX

1 – Race Studio 3 Analysis in a few words 3
2 – RS3Analysis log in and database 4
2.1 – RS3Analysis Log in feature and cloud services 4
2.2 – The software database 9
2.3 – Sessions database 11
2.4 – Selected session 12
2.4.1 – Laps summary preview 18
2.4.2 – Laps report preview 21
2.4.3 – Video preview 22
2.4.4 – Map preview 23
2.4.5 – Weather preview 24
2.4.6 – Advanced Info preview 27
3 – Analysis views 28
3.1 – Add/removing a panel to/from the software view 30
3.2 – The software top keyboards 33
3.2.1 – Math Channels Settings 35
3.2.2 – Split division selector 36
3.2.3 – Create a new track map 37
3.2.4 – Plot settings 38
3.3 – View Options and Profiles 39
4 – Data-Movies layout 42
4.1 – Showing/Hiding a panel from the software view 43
4.2 – Table of Channels and table of laps 45
4.2.1 – Generating a predictive reference lap from a recorded lap 49
4.3 – The track view 51
4.4 – Time/distance view: settings and keyboard working modes 52
4.5 – Graph settings 54
4.5.1 – Time compare settings 56
4.5.2 – Cursor settings 57
4.5.3 – Tags settings 57
4.5.4 – Setting graphs in delta mode and managing it 58
4.5.5 – Highlighting Max/Min values placements for a channel 59
4.5.6 – Managing labels on plot “X” and “Y” axis 60
4.5.7 – Choose which channels to display 61
4.6 – The time/distance keyboard working mode 62
4.6.1 – Plotting the graph by Time/Distance 62
4.6.2 – Graph zooming 65
4.6.3 – Graph Snap ON/OFF mode 66
4.6.4 – Local Time ON/OFF (local time versus normal time) 67
4.6.5 – Graph in delta Mode 69
4.6.6 – Graphs plotting overlapped 70
4.6.7 – Graphs plotting mixed 71
4.6.8 – Graph plotting tiled 72
4.6.9 – Graph plotting smart 73
4.6.10 – Graph plotting smart tiled 74
4.7 – Managing track splits 75
4.8 – The movie(s) panel 77
4.9 – The storyboard 79
5 – Time-Distance layout 80
6 – Track split report layout 81
6.1 – Adding/Removing/Sorting items 84
6.2 – Managing side items 85
6.3 – Showing/Hiding statistics 86
6.4 – Choosing the report type 87
7 – Scatter Layout 88
8 – Histogram Layout 91

9 – Split Times report layout 94
9.1 – The top keyboards 95
9.2 – The split report table and its available layouts 97
9.2.1 – Statistics: average value 99
9.2.2 – Statistics: median value 100
9.2.3 – Statistics: best theoretical time 100
9.2.4 – Statistics: best rolling time 101
9.3 – Absolute fractional mode 102
9.4 – Absolute cumulative mode 102
9.5 – Split time difference vs best split overall fractional mode 103
9.6 – Refer to best split cumulative mode 104
9.7 – Refer to best lap fractional mode 104
9.8 – Refer to best lap cumulative mode 105
9.9 – Classic/Colorize layout 106
9.10 – Settings dialog window 107
9.11 – Split graphs 108
9.11.1 – Channel graph 110
9.11.2 – Time/Lap (number) graph 111
9.11.3 – Distance/Lap number graph 112
9.11.4 – Time/Distance graph 113
10 – Channels Report layout 114
10.1 – Add/remove items in the left part of “Channels Report view” 116
10.2 – Sort items 117
10.3 – Managing Side Items 118
10.4 – Show/Hide statistics 119
10.5 – Show/Hide splits in report 119
10.6 – Managing report type 120
10.7 – The custom graph 121
11 – Log sheet layout 122
11.1 – Log sheet general information 122
11.2 – Log sheet weather 123
11.3 – Log Sheet Engine Information 124
11.4 – Log Sheet Dims (dimensions) and Weights information 125
11.5 – Log Sheet fuel Information 126
11.6 – Log Sheet gearings information 127
12 – Track Map layout 128
13 – Custom Layout 128
14 – Math channels 128
14.1 – How to add/edit a math channel 131
14.2 – LookUp tables 132
15 – Reports layout 133
15.1 – Managing, creating and editing a data report 136
15.2 – Filtering data for laps and splits report 139
15.3 – Management of scales for statistics with same units 140
15.4 – Choosing the statistics to be used 141
15.5 – Exporting data reports to printable files 142

1 – Race Studio 3 Analysis in a few words

With the new Race Studio 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 (for the last year only) 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. 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 session 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 but you find it in the recent sessions folder.
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: 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 views 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 different panels of the view.

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 Data-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.

2.1 – RS3Analysis Log in feature and cloud services

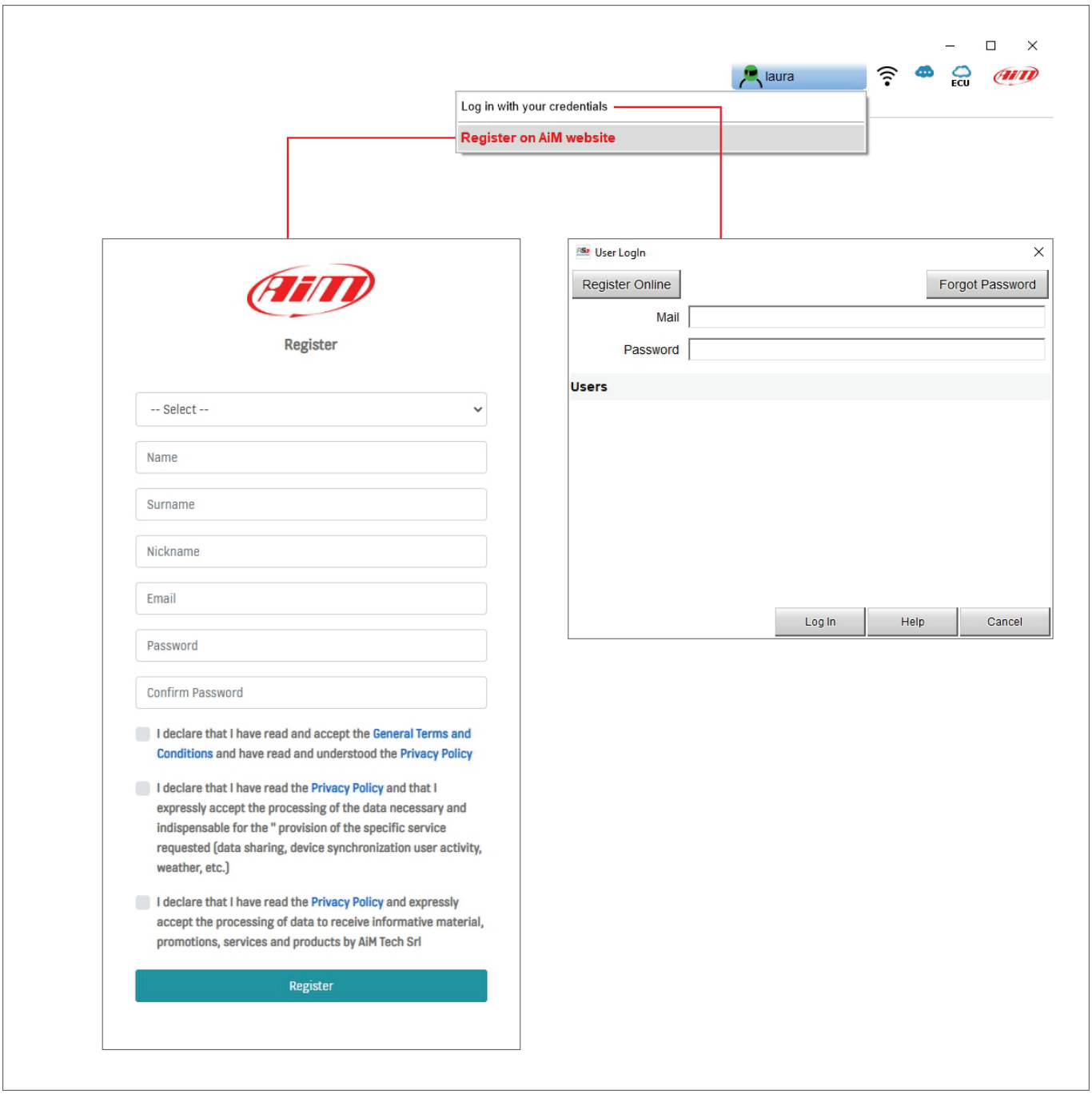
The new RS3Analysis comes with the new "Log in" feature that can be activated on the software top right keyboard.

With this new feature the user connects to AiM server where a free cloud space of 20 megabytes is available. They are to allow the user to test this feature. Additional space is 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 (see chapter 14) and sessions (see paragraph 2.3).

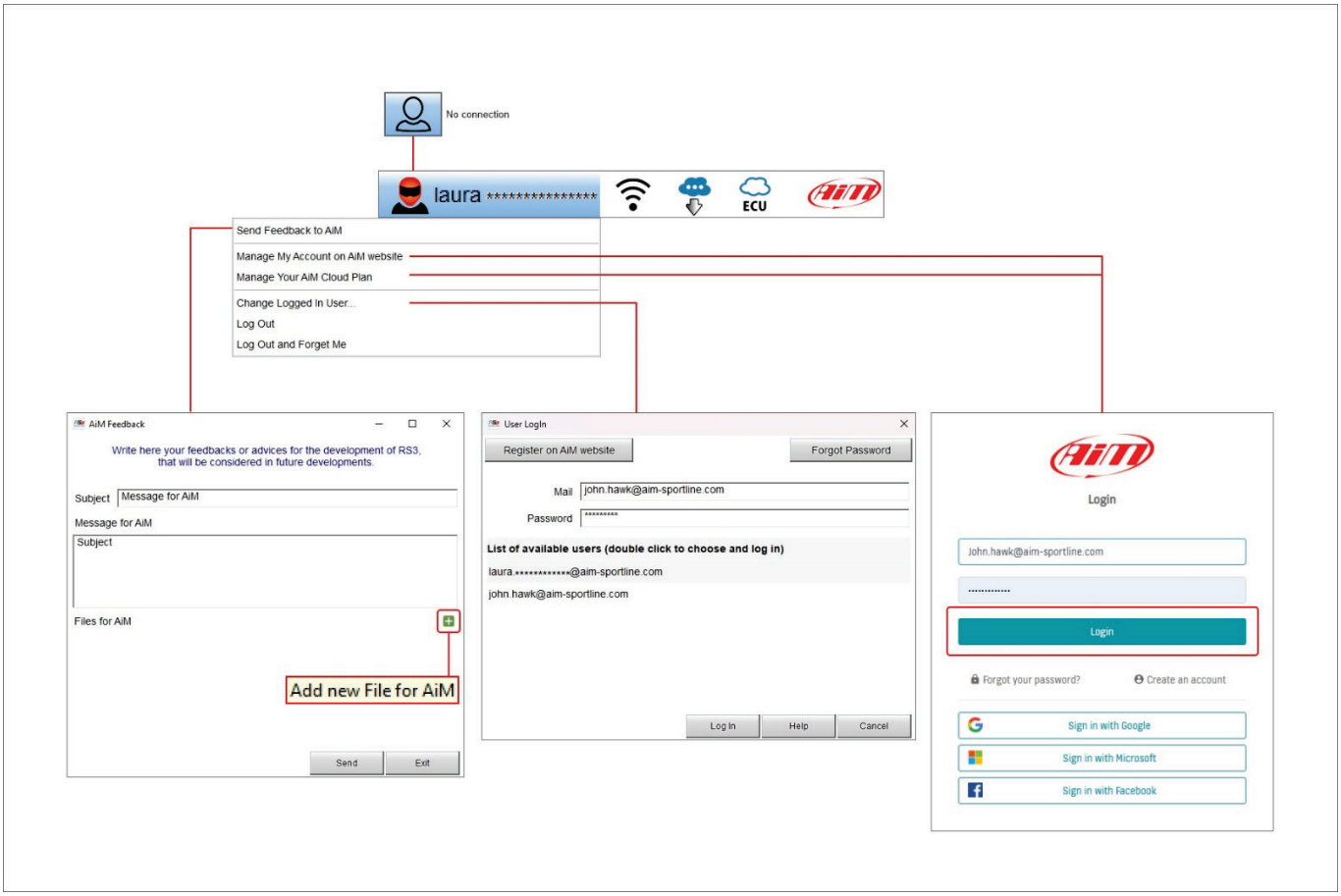
At the very first use "Log In" icon is as shown above and it opens a menu.

If you do not have the credentials select "**Register on AiM website**" and fill in the dialog window that is prompted (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.

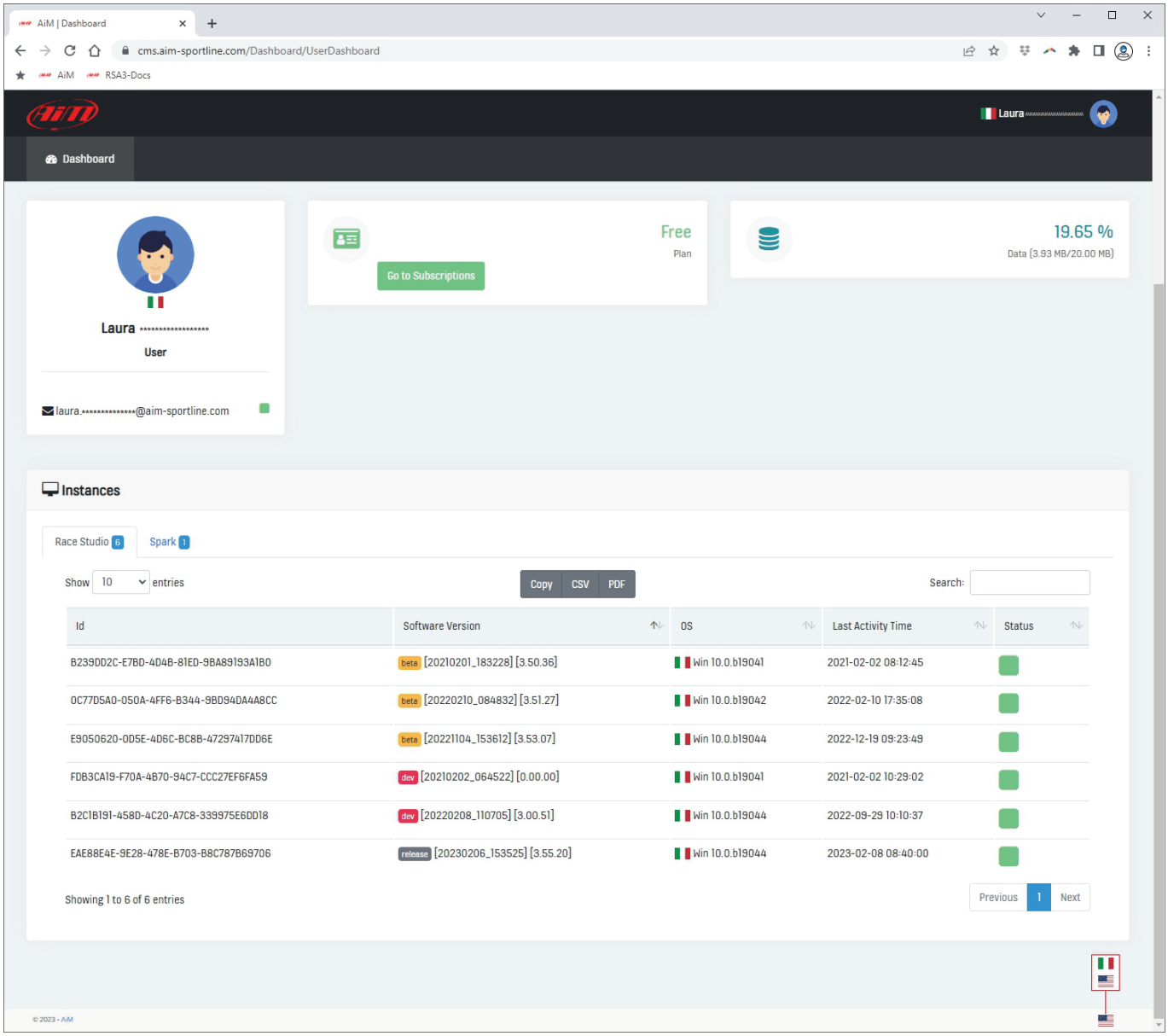
Once the registration procedure correctly performed you have different options.



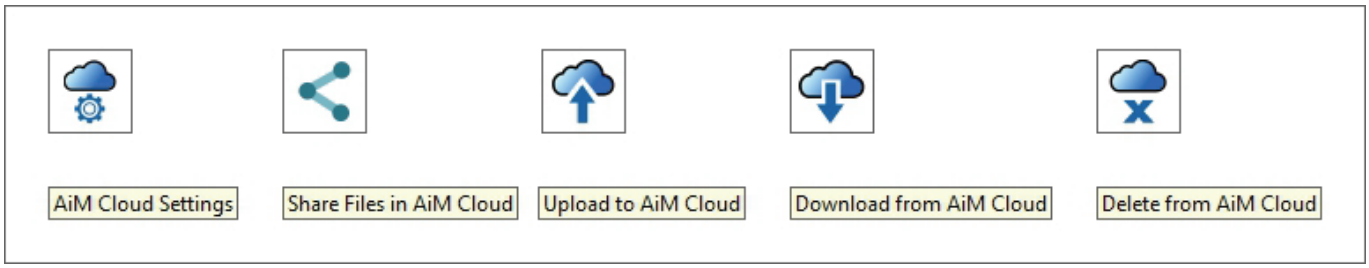
- **Send a feedback to AiM**: a dedicated dialog window is prompted; you can:
  - define a subject
  - write a message that goes directly to AiM technicians
  - add a file pressing "+" button and loading it
- **Manage your account on AiM website**: it opens a login page on the Internet; logging in you enter a personal dashboard, explained in the following page.
- **Manage Your AiM cloud plan**: all available plans are prompted and you can change your current one to another that better fits your needs
- **Change logged user**: assuming 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 your PC
- **Log out and forget me**: exit the software and removes user data from the PC but not from AiM server; the next time AiM server will propose you to use your old account or to register for a new one

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

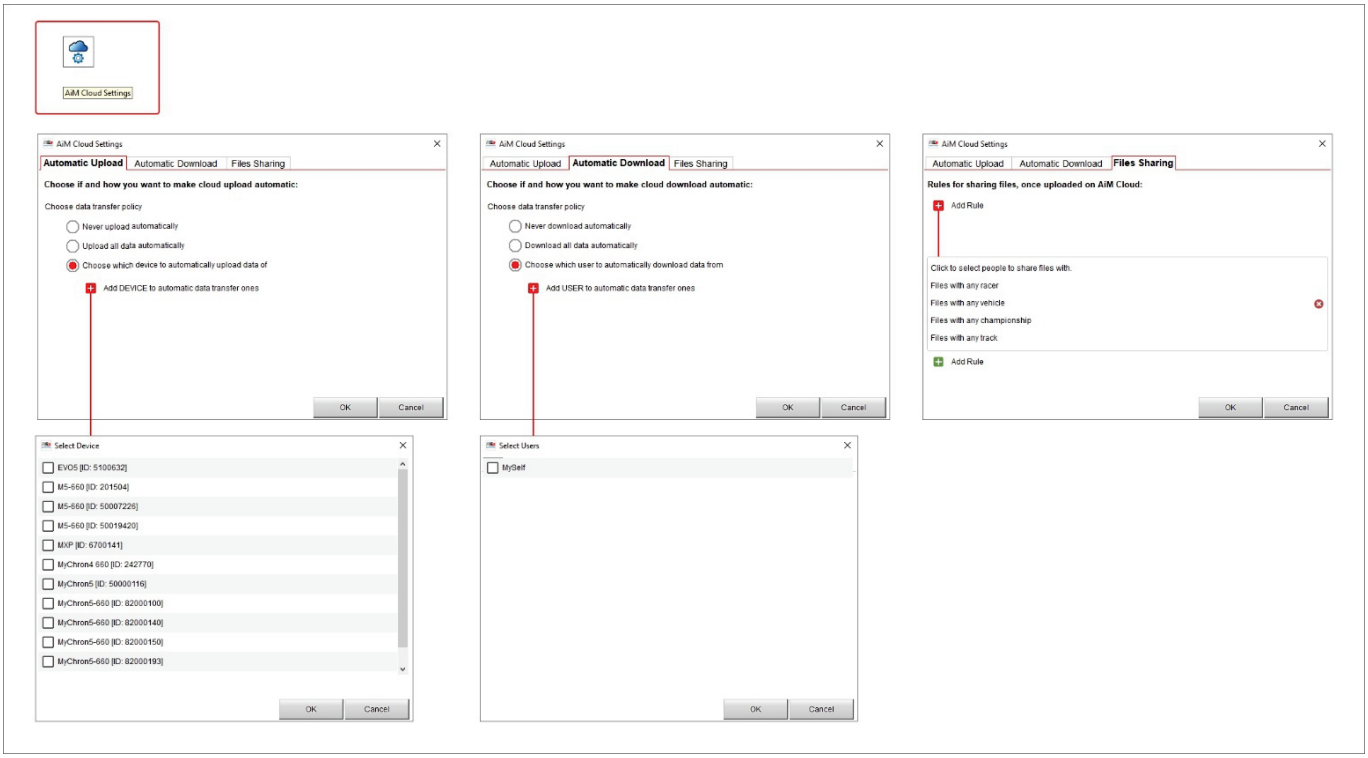
- see all information you uploaded
- copy the instances or download them in different formats: CSV, PDF
- update user information selecting “Account” option on the top right button of the page; the related page opens and data can be updated and saved at the end
- logout



Cloud options are indicated by icons, shown below, that appears on the software central keyboard only when you need them.



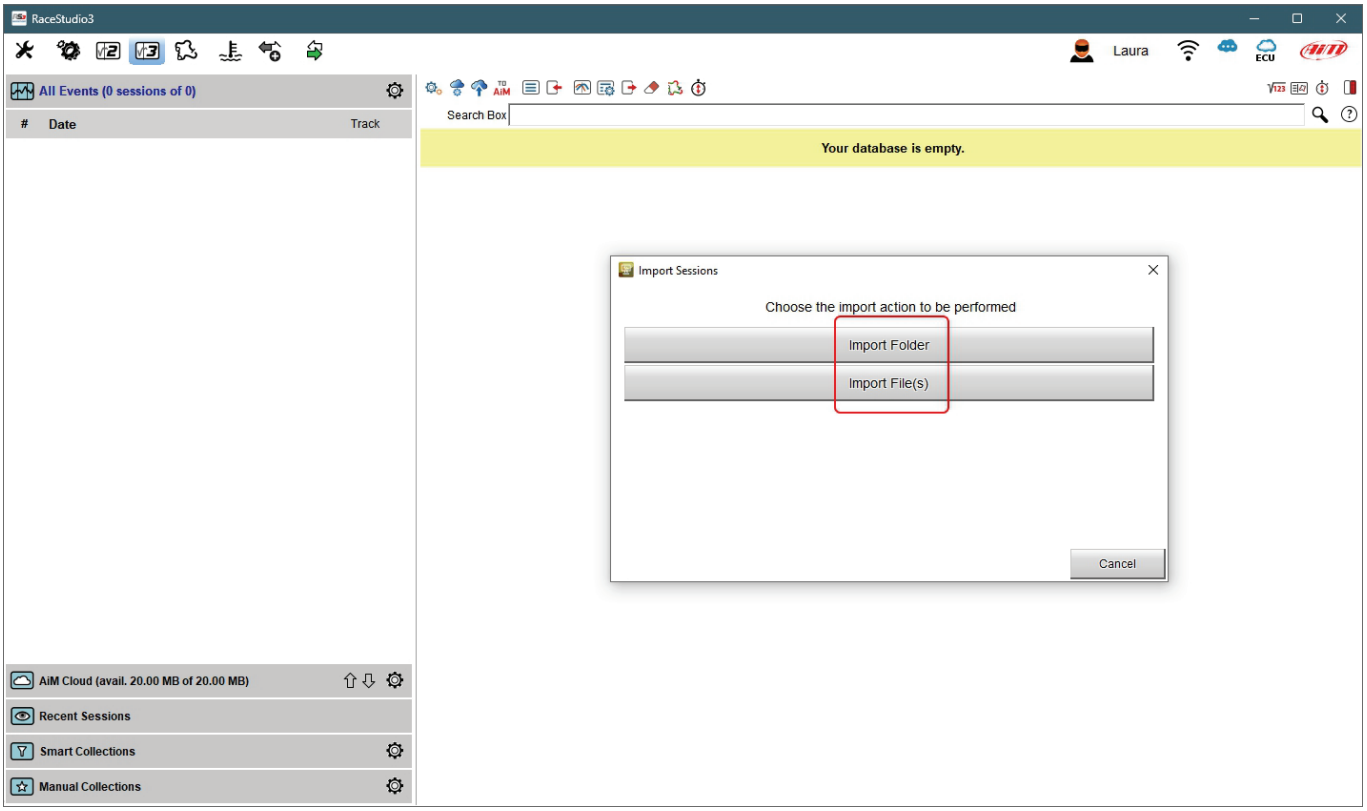
AiM Cloud settings icon allows the user to set some parameters as shown here below.



- **Automatic Upload**: you can manage automatic upload of your files (never/all) as well as decide (pressing "+") that one or more devices among these you already have data downloaded from will have their files automatically uploaded on your cloud; this is very useful if you want to be sure not to lose particular data or if you are a coach and you need to always have under control some particular data.
- **Automatic Download**: you can manage automatic data transfer policy (never/all) as well as decide (pressing "+") that one or more users among these already downloaded data will have their files automatically uploaded on your cloud; this is very useful if you want to be sure not to lose data of one or more racers.
- **Files Sharing**: pressing "+" you can decide to share your file with any racer, vehicle, championship, track your downloaded data belong to or, clicking on any of these parameters, select a particular racer, vehicle, championship, track to share your data with.

2.2 – The software database

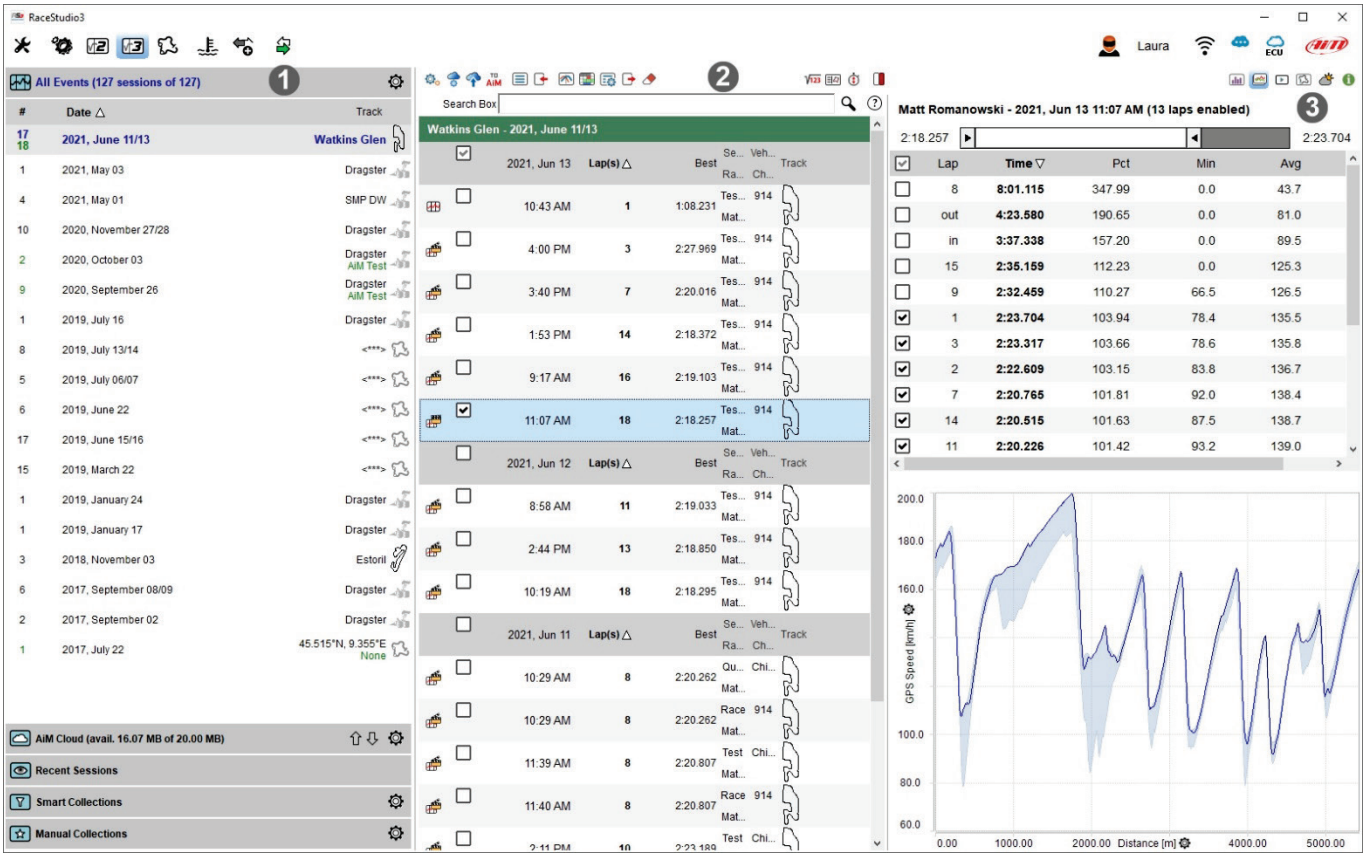
RS3Analysis is typically run after data download and this means that the software database populates automatically but previous data can also be imported from an external drive. In this case at the very first time the software database is empty and this dialog window is prompted.



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 you.

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**)

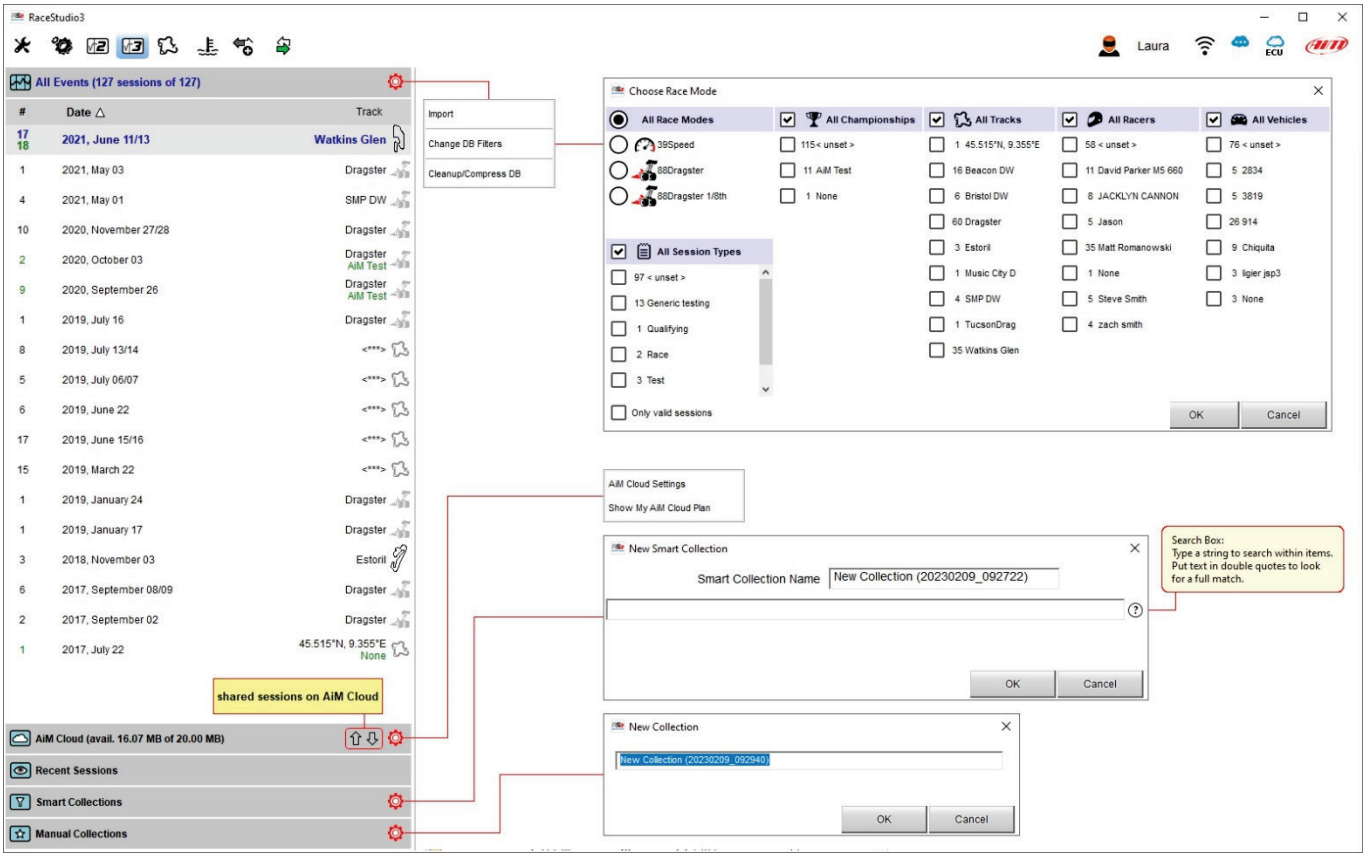


2.3 – Sessions database

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:

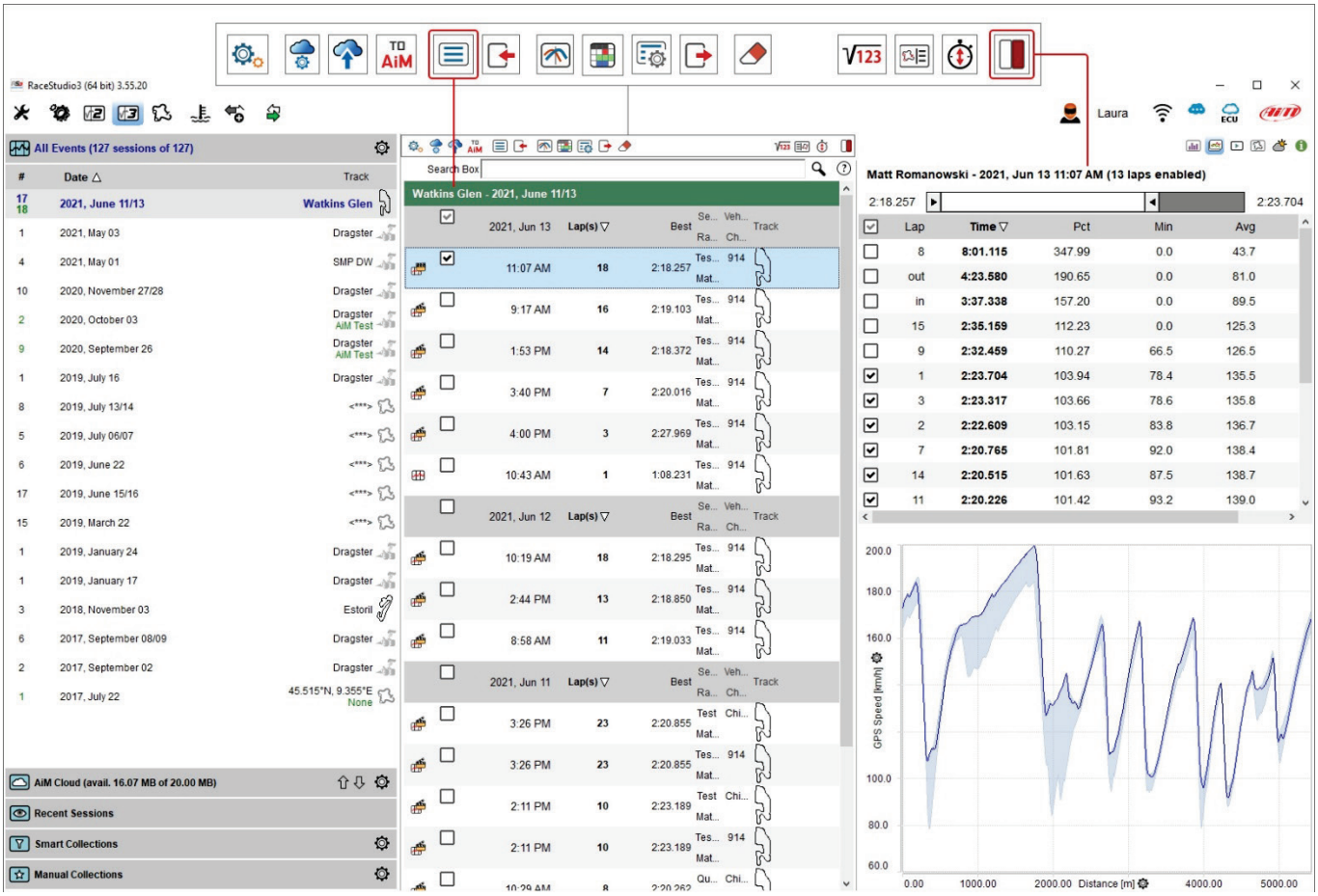
- **AiM Cloud**:
  - shows all sessions uploaded on AiM cloud
  - allows to enter cloud settings (see paragraph 2.1) and shows the related icons
  - shows your current AiM Cloud Plan and allows you to enter AiM Cloud plan settings
- **Recent sessions**: this database remembers the last 30 sessions you have interacted with; the very first time it 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 tooltip 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 is 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.



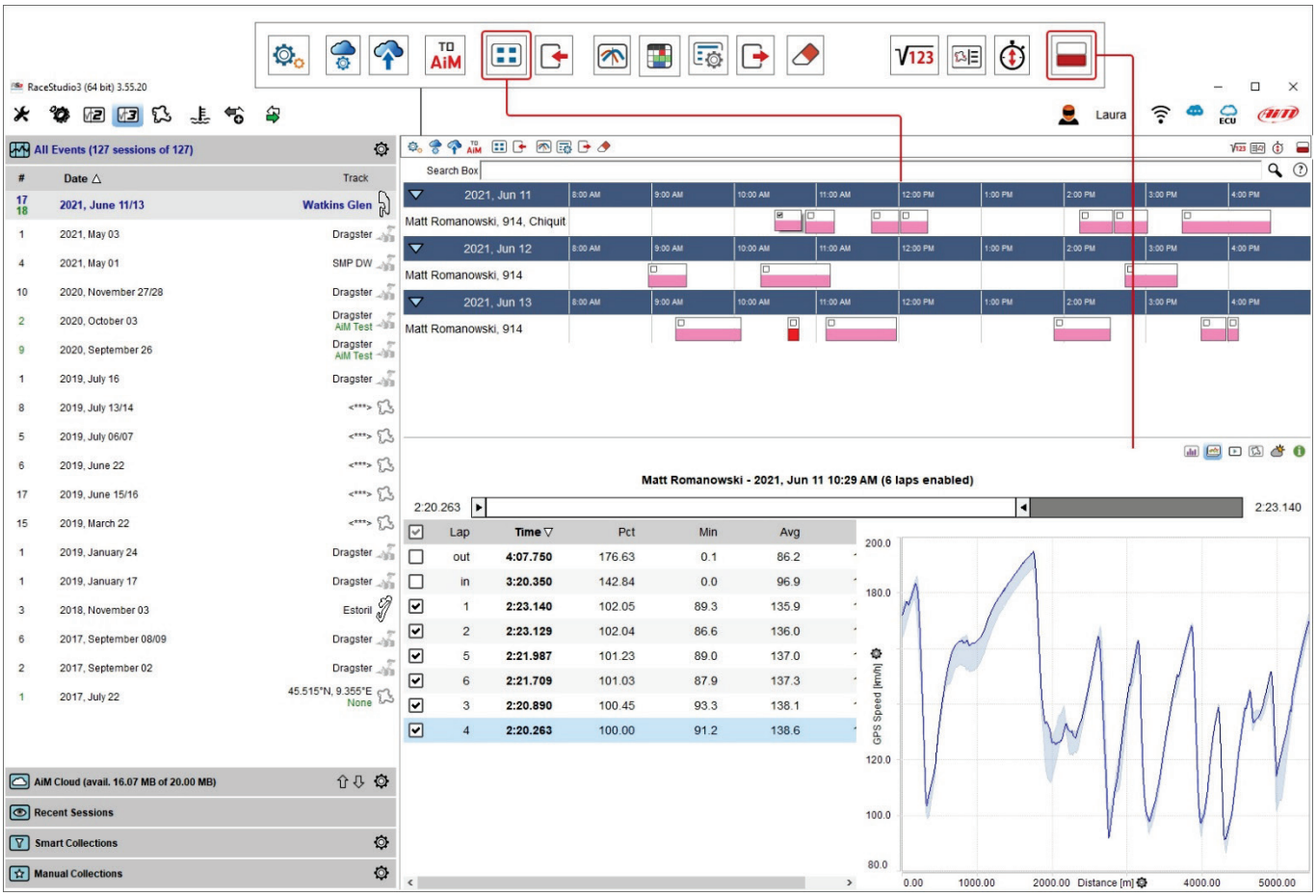
2.4 – Selected session

When the session to view is selected it appears in the **central** part of the page. The session view can be list, agenda and the different preview window can be shown right, bottom or hidden. By default all sessions are grouped by date; click on any column header to change the order criteria.

The following image show: list/right view.



The following image show: agenda/bottom view.



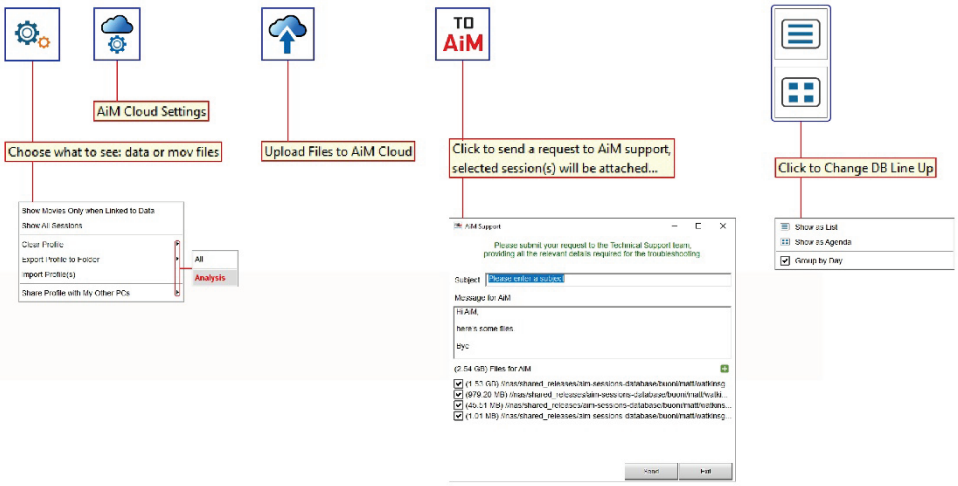
Top of "Selected session" column is a keyboard, shown here below and deeply explained in the following page.

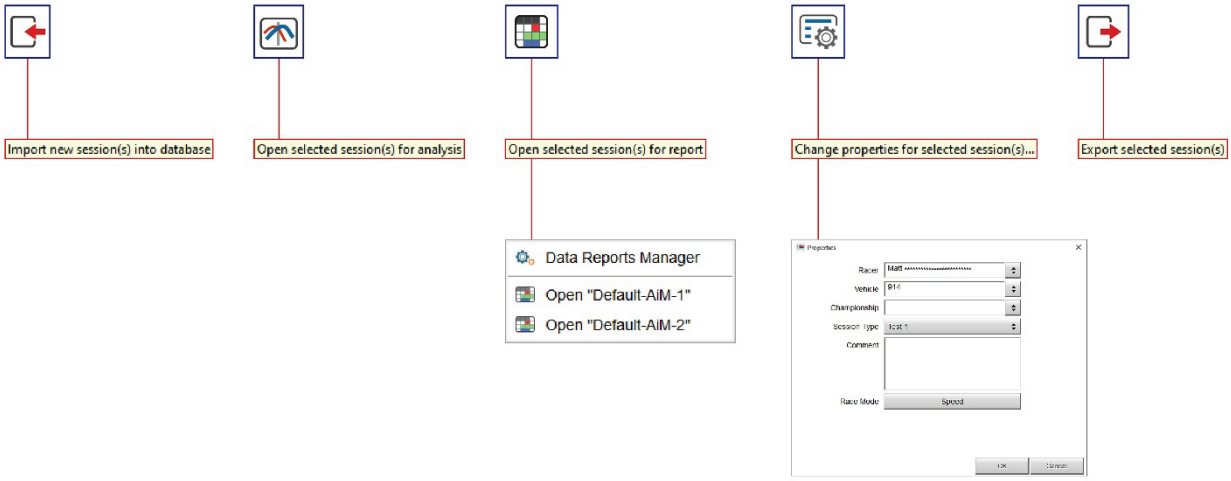
From left to right the buttons indicate:

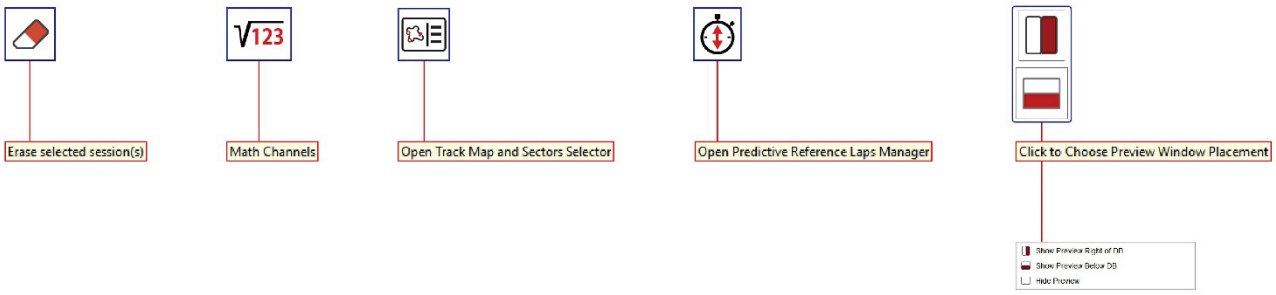
- **Choose what to see**: allows you to choose what sessions to show; available options are:
    - Show movies only when linked to data; appears only if the selected session contains video
    - Show all sessions
    - Export Profile to folder (All or Analysis*)
    - Import profile(s)
    - Share Profile with my other PC

    ***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.

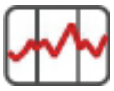
- **AiM Cloud settings**: see paragraph 2.1
- **Upload Files to** your **AiM cloud** drive
- **Send a request to AiM support**: it activates a dialog window where to insert an object and a message addressed to AiM support team that makes easier and quicker for AiM service to investigate the problem; **Please note**: selected session(s) will be attached to the message; if no session is selected the panel is not prompted
- **Change DB line up**: switch the view from list to agenda and vice-versa; by default "group by day" checkbox is enabled.
- **Import new session(s) into database**: windows explorer window is prompted: browse it to find the session(s) to import
- **Open selected session(s) for analysis**
- **Open selected session(s) for report** (see chapter 15)
- **Change properties for the selected session(s)**: in the panel prompted you can fill the desired information and a comment too
- **Export selected session(s)**: windows explorer window is prompted: browse it to choose where to export the selected session(s)
- **Erase** the selected session
- **Math channels**: opens math channels dialog window (see chapter 14 for further information).
- **Open Track Map and Sector Selector**: the track map with sectors is prompted; you can manage them
- **Open Predictive Reference Laps Manager**: reference laps of all tracks stored in the PC are prompted and you can manage them (see paragraph 4.2.1)
- **Preview Windows placement**: preview windows can be placed bottom of the sessions list, on the right of it or hidden.


AiM Cloud Settings
Choose what to see: data or mov files
Upload Files to AiM Cloud
Click to send a request to AiM support, selected session(s) will be attached...
Click to Change DB Line Up


Import new session(s) into database
Open selected session(s) for analysis
Open selected session(s) for report
Change properties for selected session(s)...
Export selected session(s)
Data Reports Manager
Open "Default-AiM-1"
Open "Default-AiM-2"


Erase selected session(s)
Math Channels
Open Track Map and Sectors Selector
Open Predictive Reference Laps Manager
Click to Choose Preview Window Placement

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 explained.



Session including only data

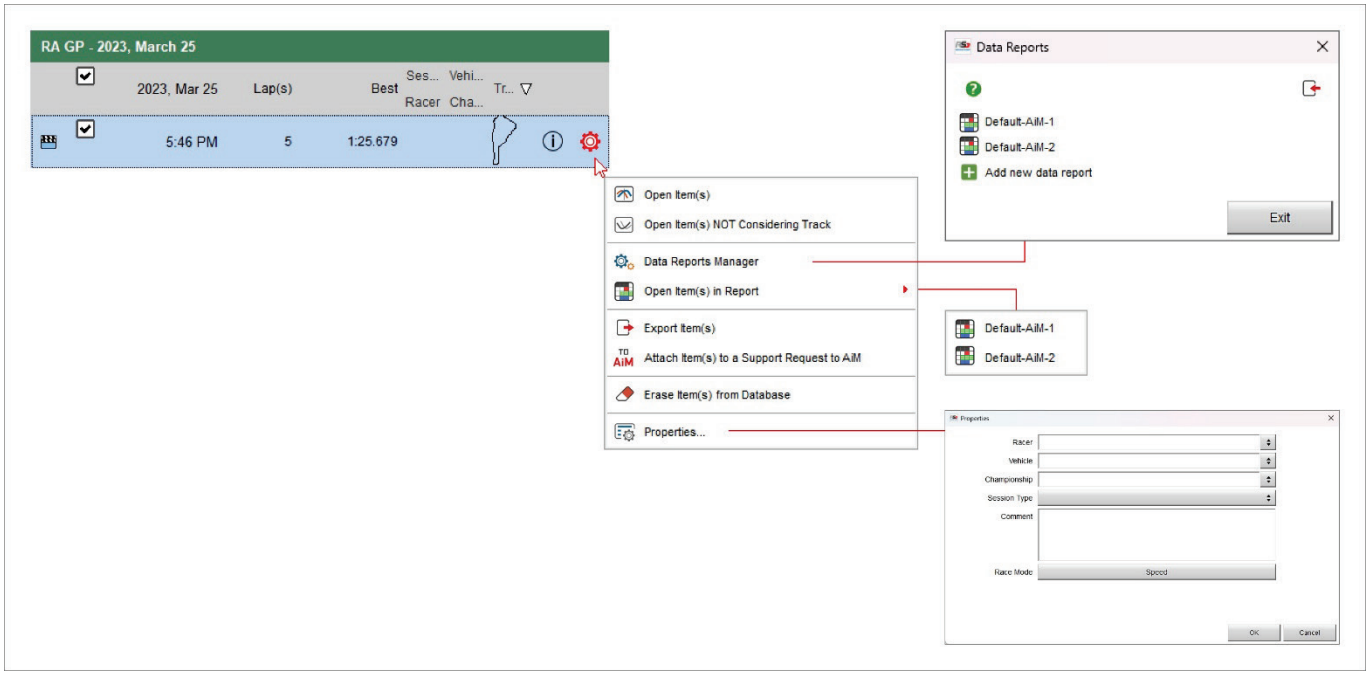
Session including only video

Session including data and video

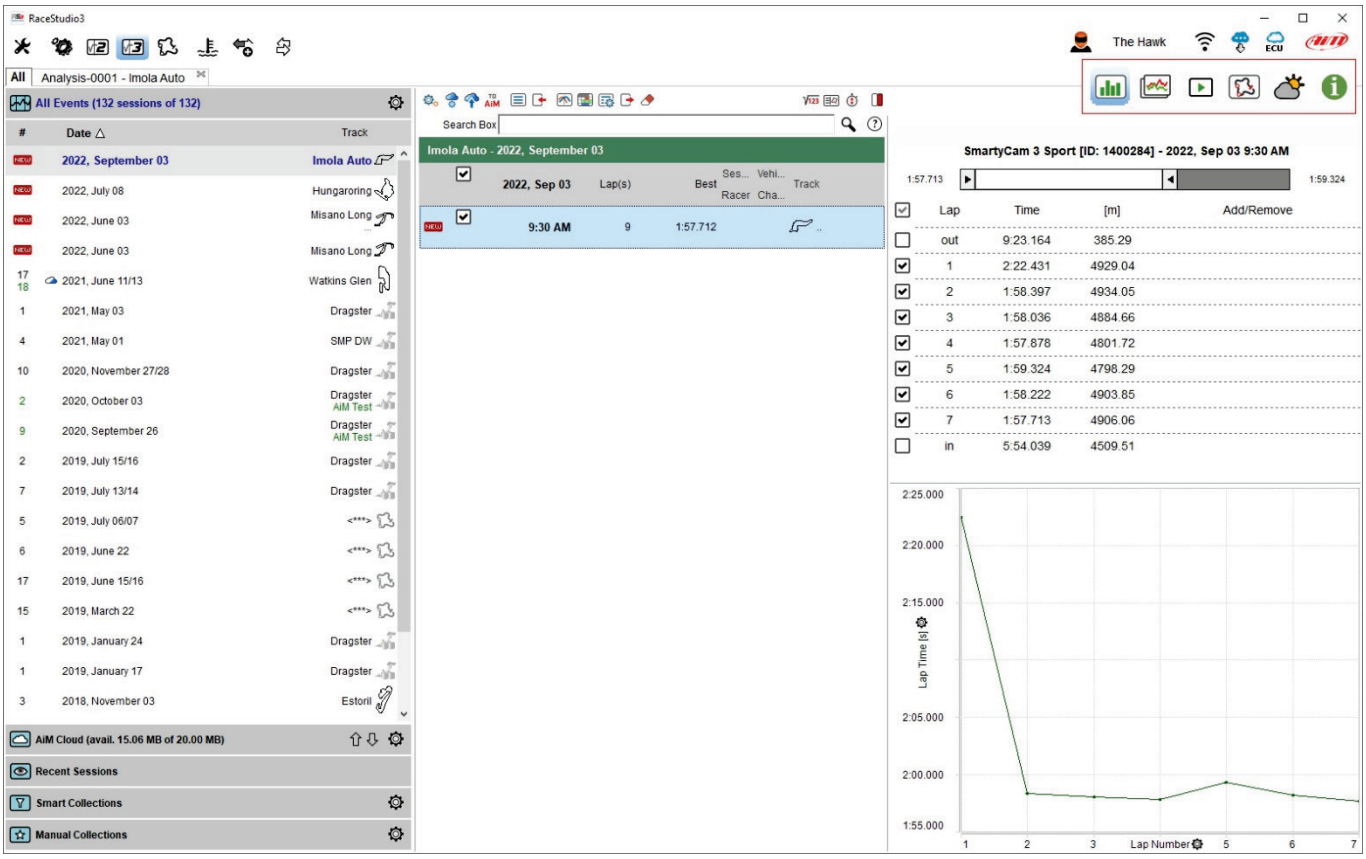
Session coming from a Sim racing

As shown here below, mousing over a session a setting icon is prompted that allows to:

- Open a session
- Open a session **NOT** considering Track (this can be very useful to compare similar sections of different tracks)
- Manage data reports (see chapter 15)
- Open items in reports (see chapter 15)
- Export the session
- Attach the session to a support request to AiM team
- Erase the session from the PC database
- Modify session properties



Data preview of the selected session is shown right of the page. It changes according to the key pressed on the keyboard placed top right of the view straight above the data 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.

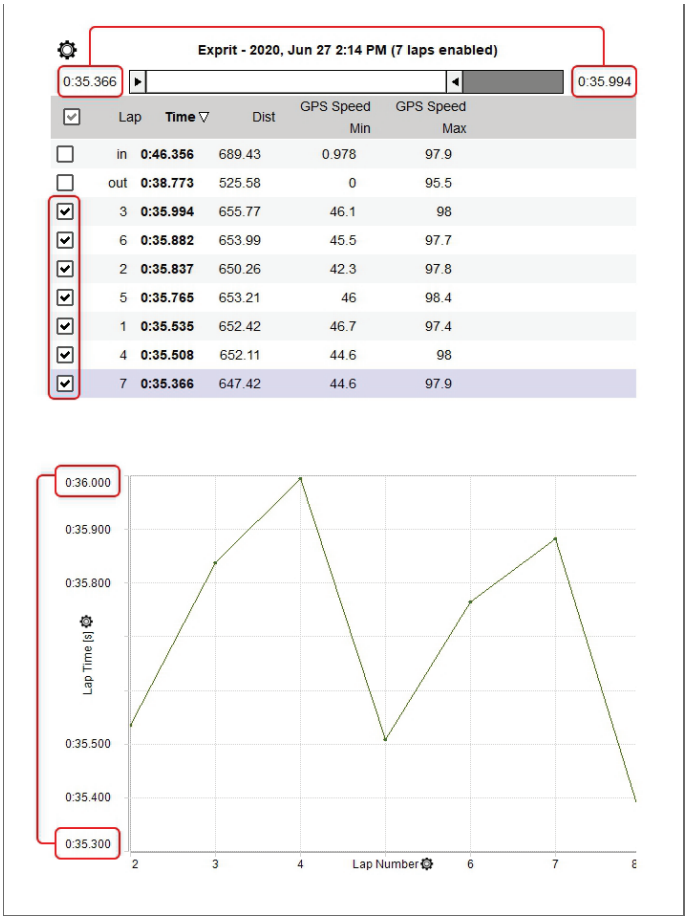
2.4.1 – Laps summary preview

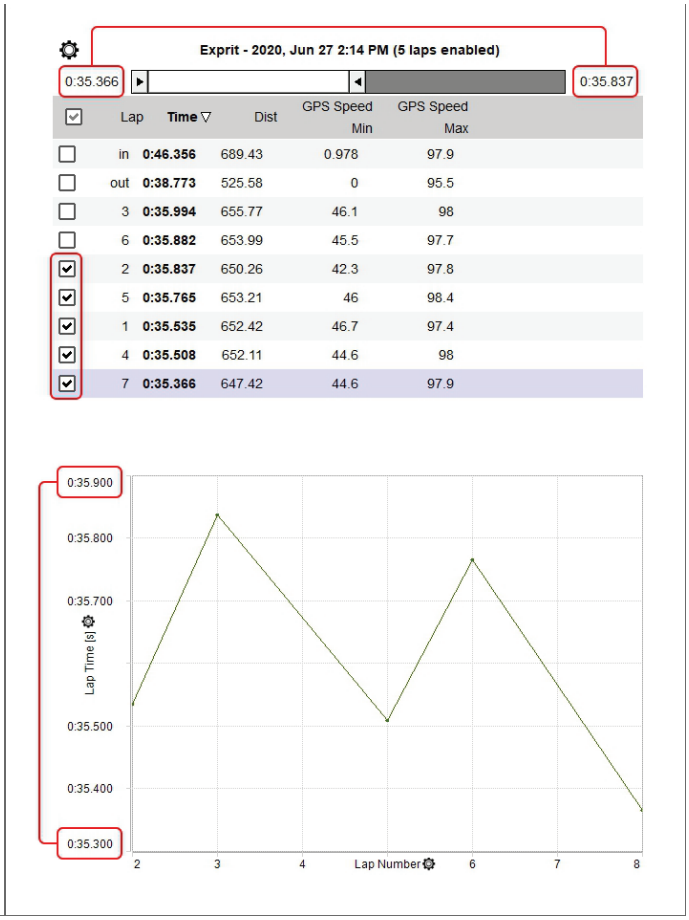
Laps summary preview shows by default all the laps except for the first and the last one (left image below) and the related max/min lap time values are indicated side of the top sliding bar and in the bottom graph.

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 setting icon top left of 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 through the mouse wheel.

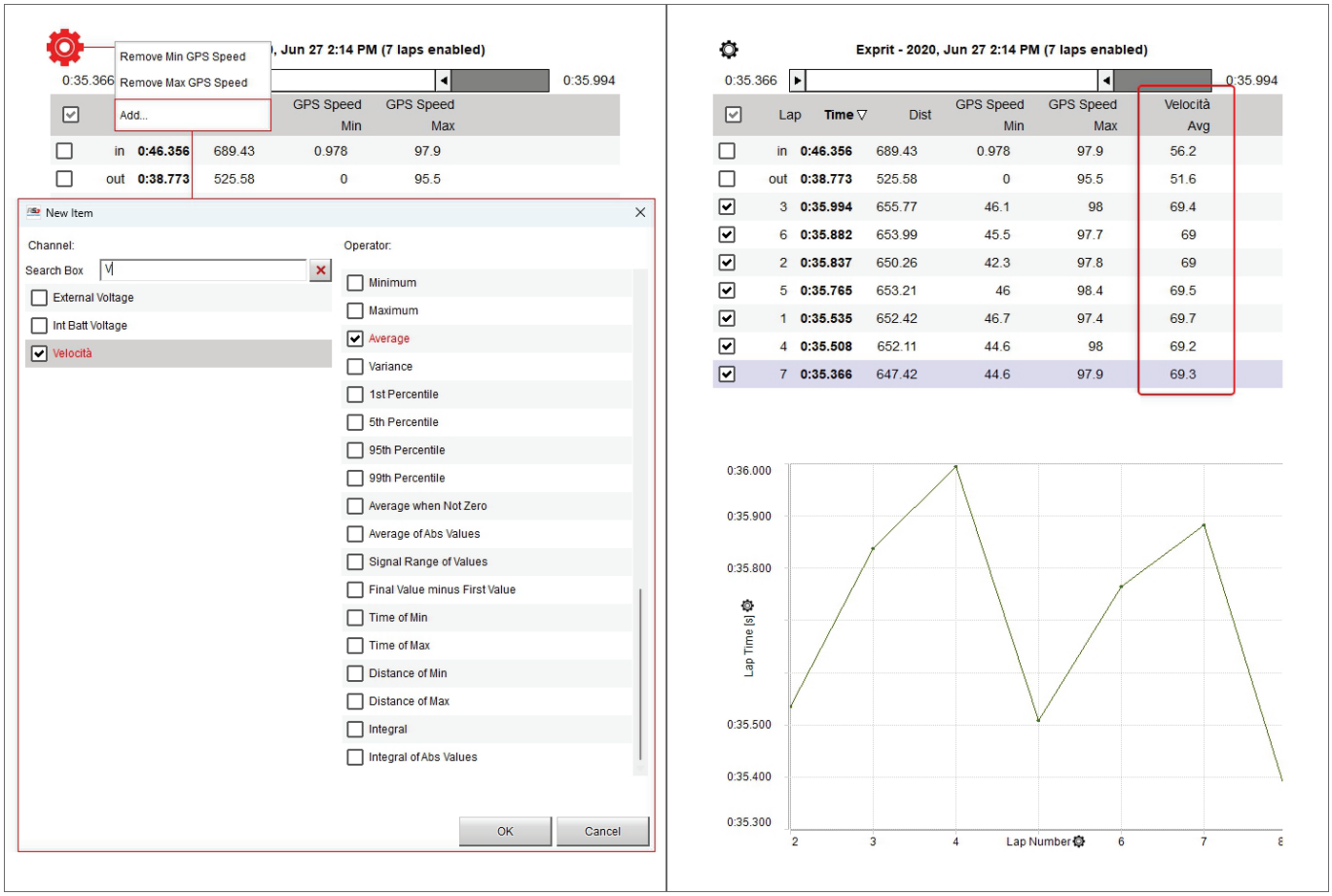




As shown here below on the left, to add a channel:

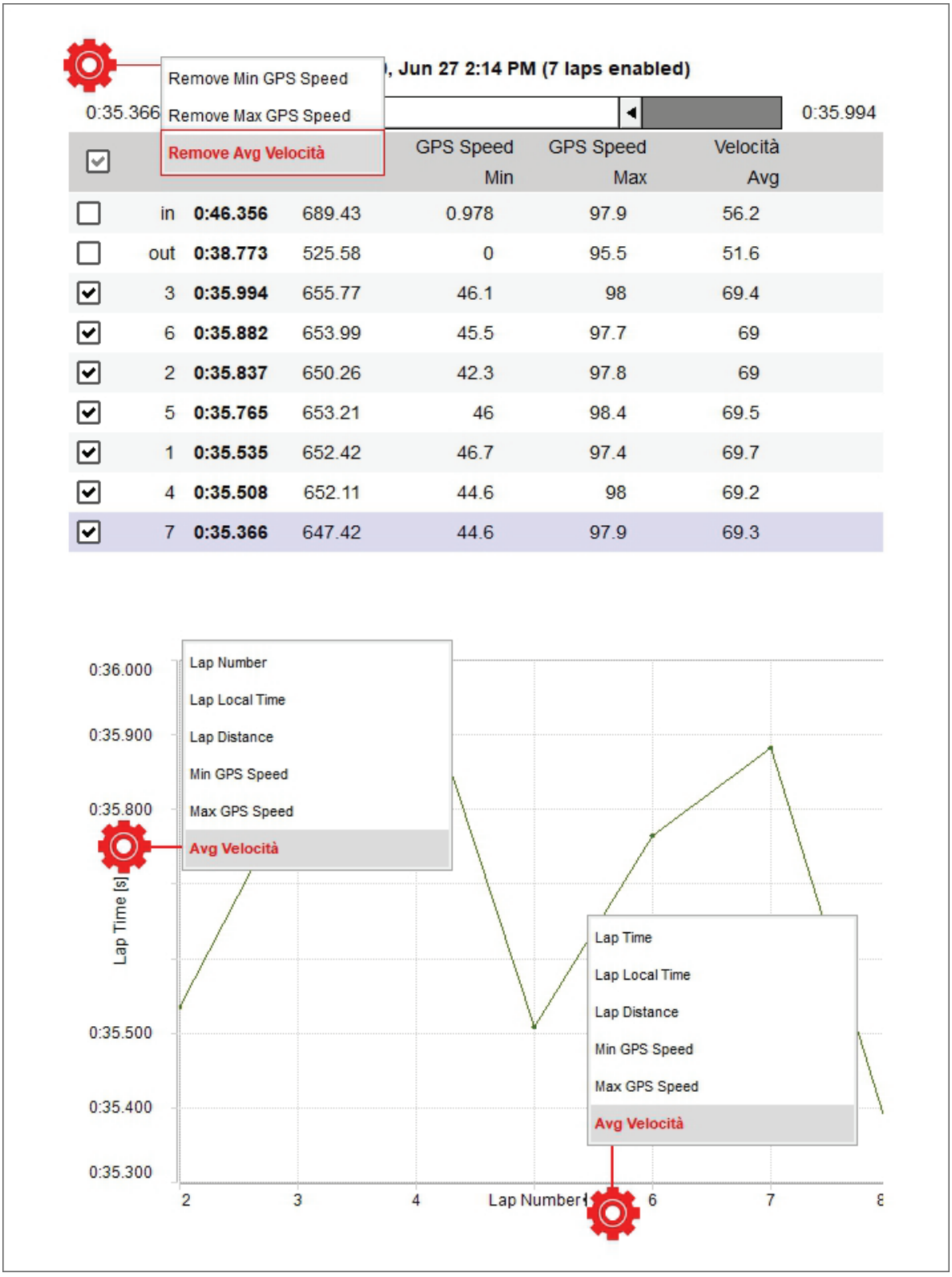
- Click the setting icon and select “Add”
- Select the desired channel in the list or search for it filling in “Search Box”
- Click “OK”

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:

- remove the added channel clicking the top left setting icon 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

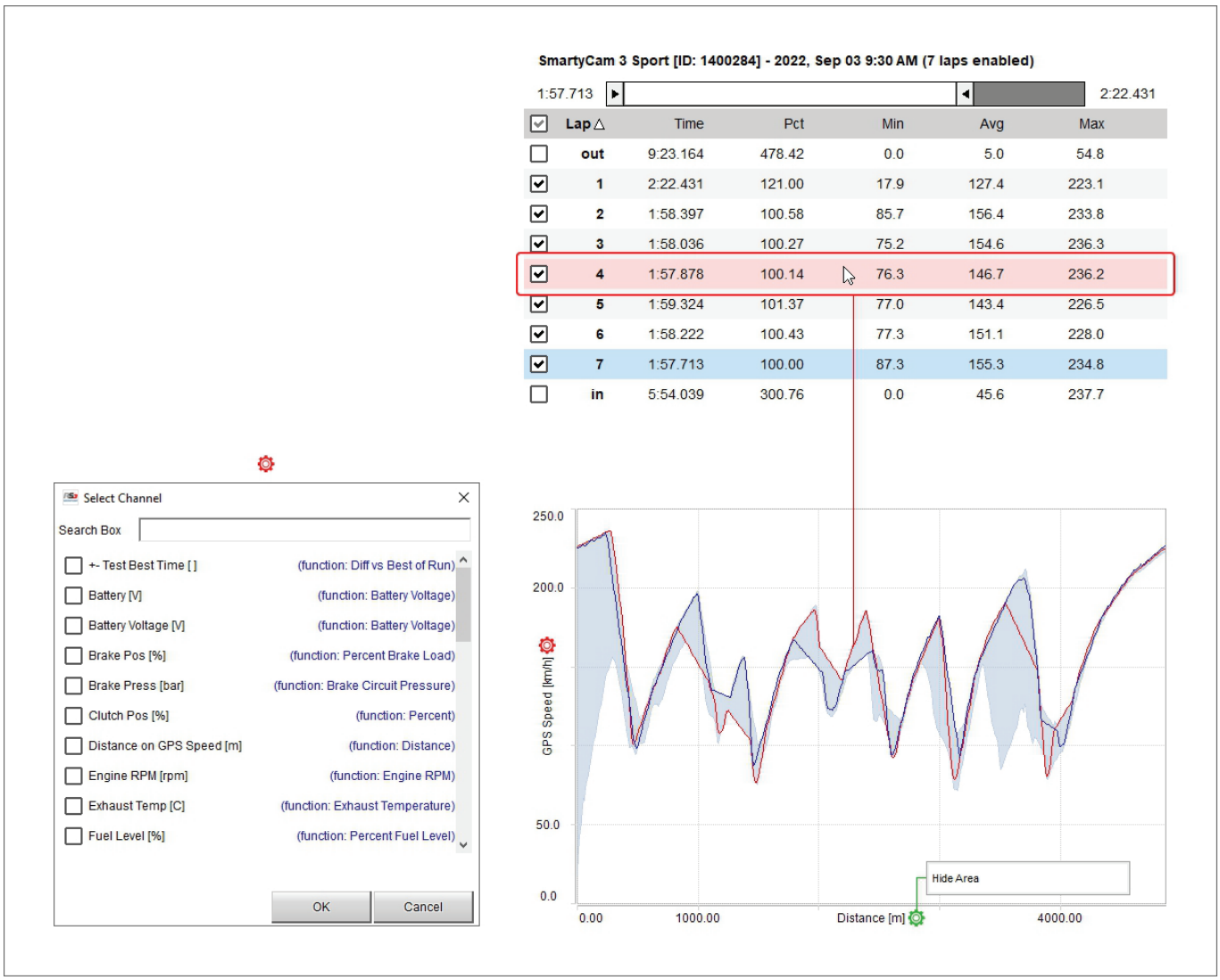


2.4.2 – Laps report preview

Laps report is the view shown by default when you enable a session in the central column. By default it shows the laps ordered by lap time and sliding the top bar you can select only laps in a fixed lap time range as well as show them in the graph. Mousing over the laps list the line of the lap you are mousing over becomes red in the graph.
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).

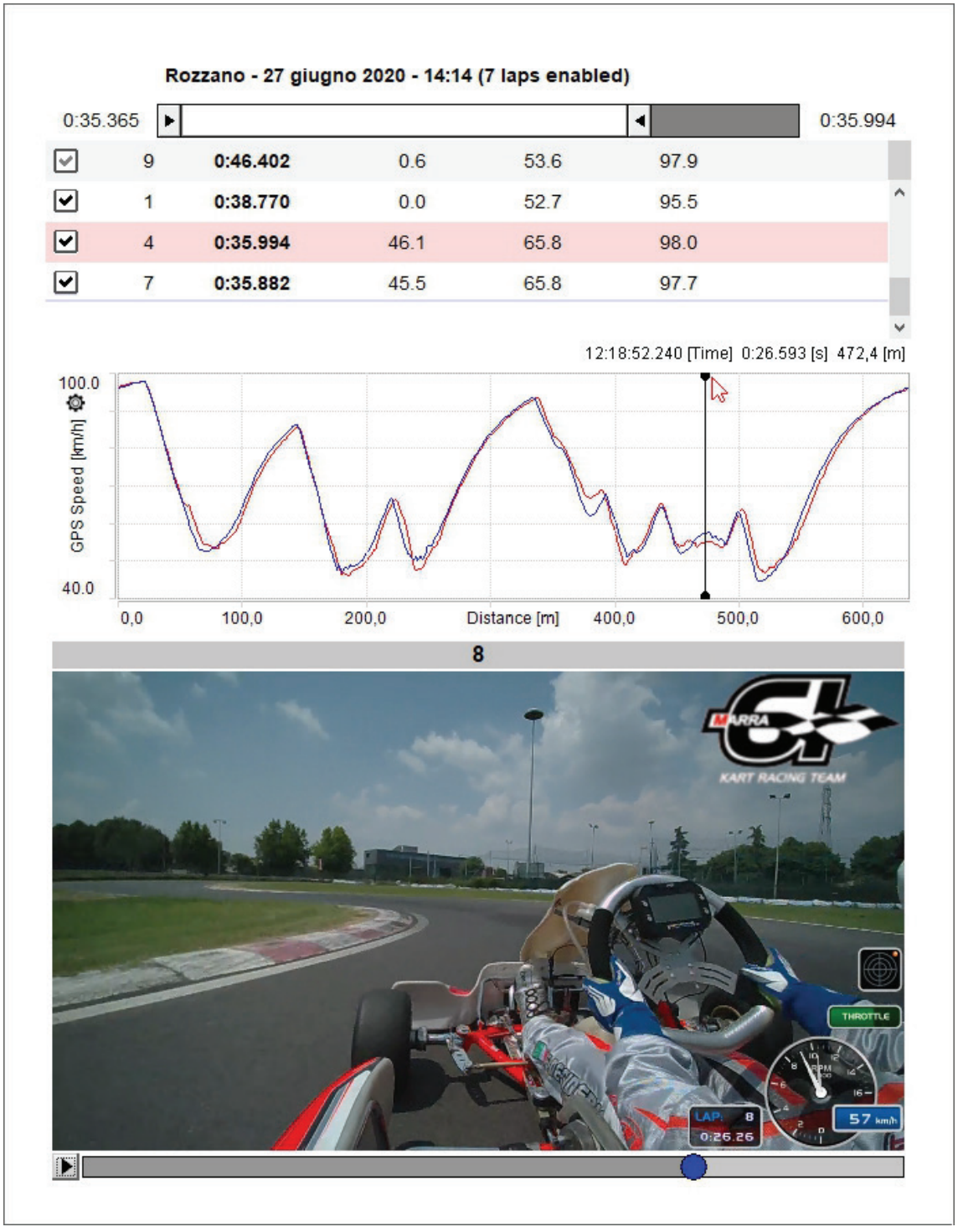
The graph has a sort of grey/light blue shadow that highlights the range set with the top sliding bar. To hide this background click the setting icon on the abscissa axis (green below) and then click "Hide Area".

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



2.4.3 – Video preview

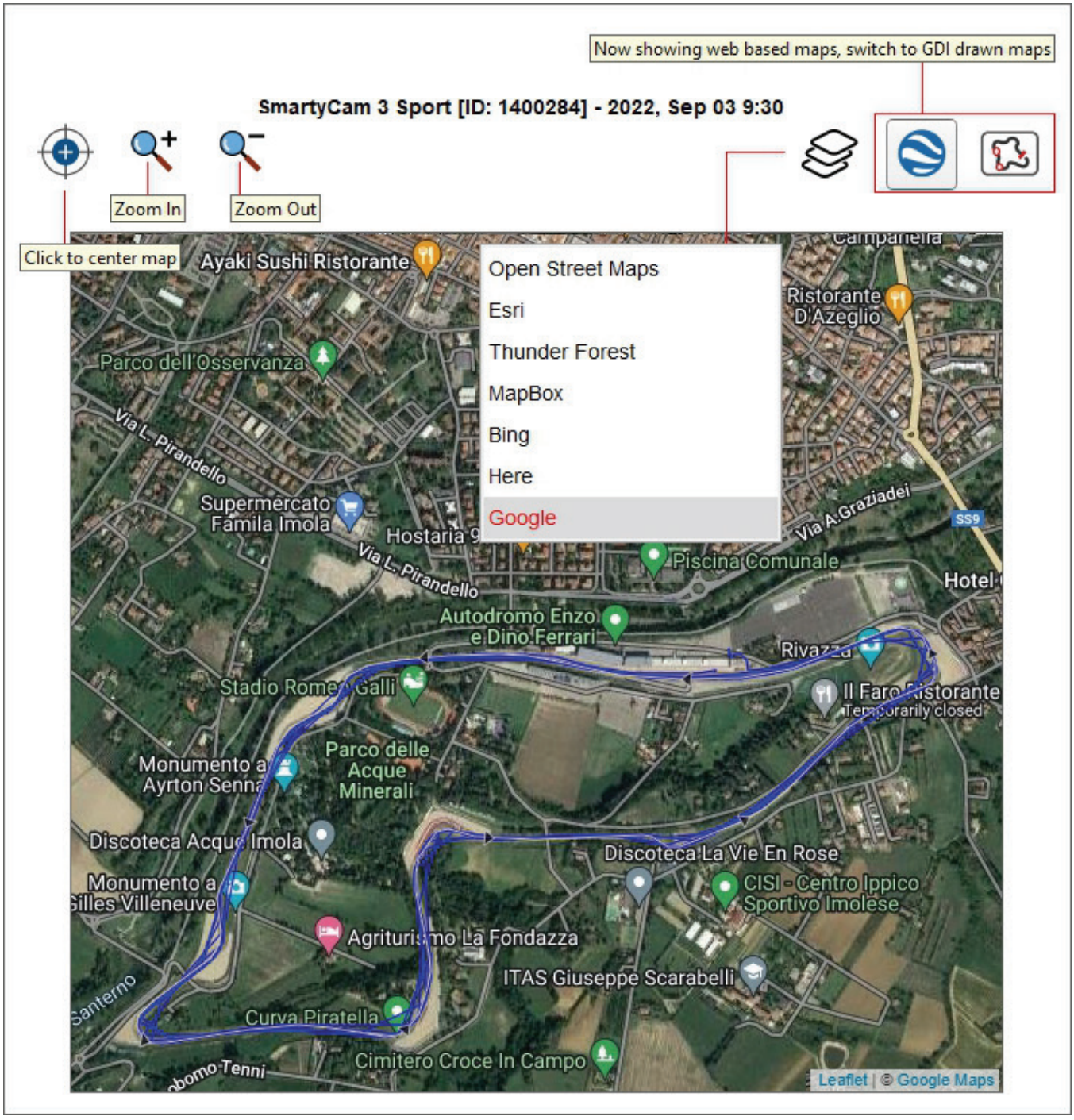
Video preview works mostly like the previous two. Pressing “Play” button bottom left of the preview, the video plays and the cursor on the central graph moves simultaneously. Clicking on a point in the graph the video goes to that point .



2.4.4 – Map preview

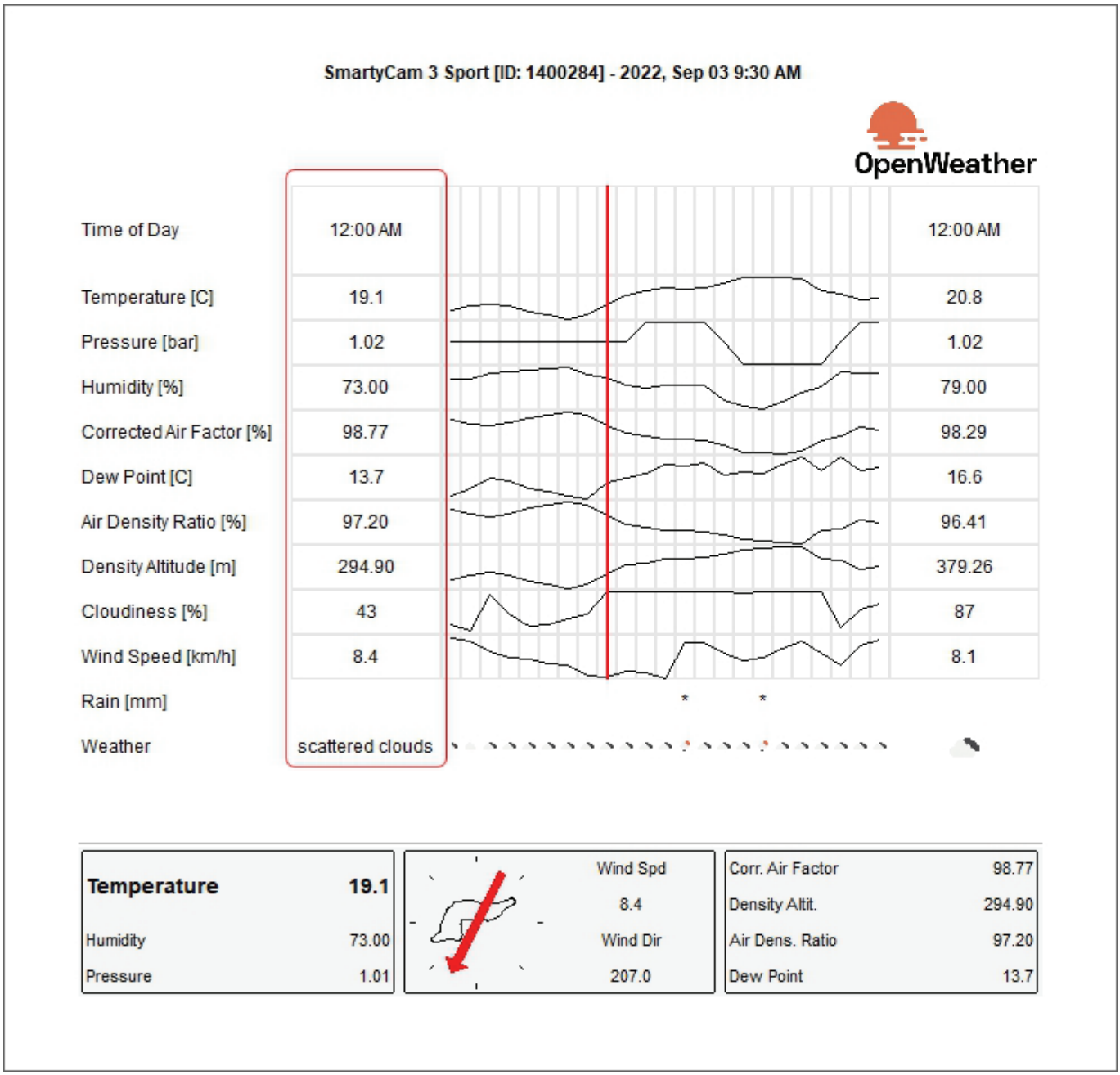
Map preview shows the track map and you can:

- 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 based maps and GDI drawn map; the top right button in the image below changes according to the view

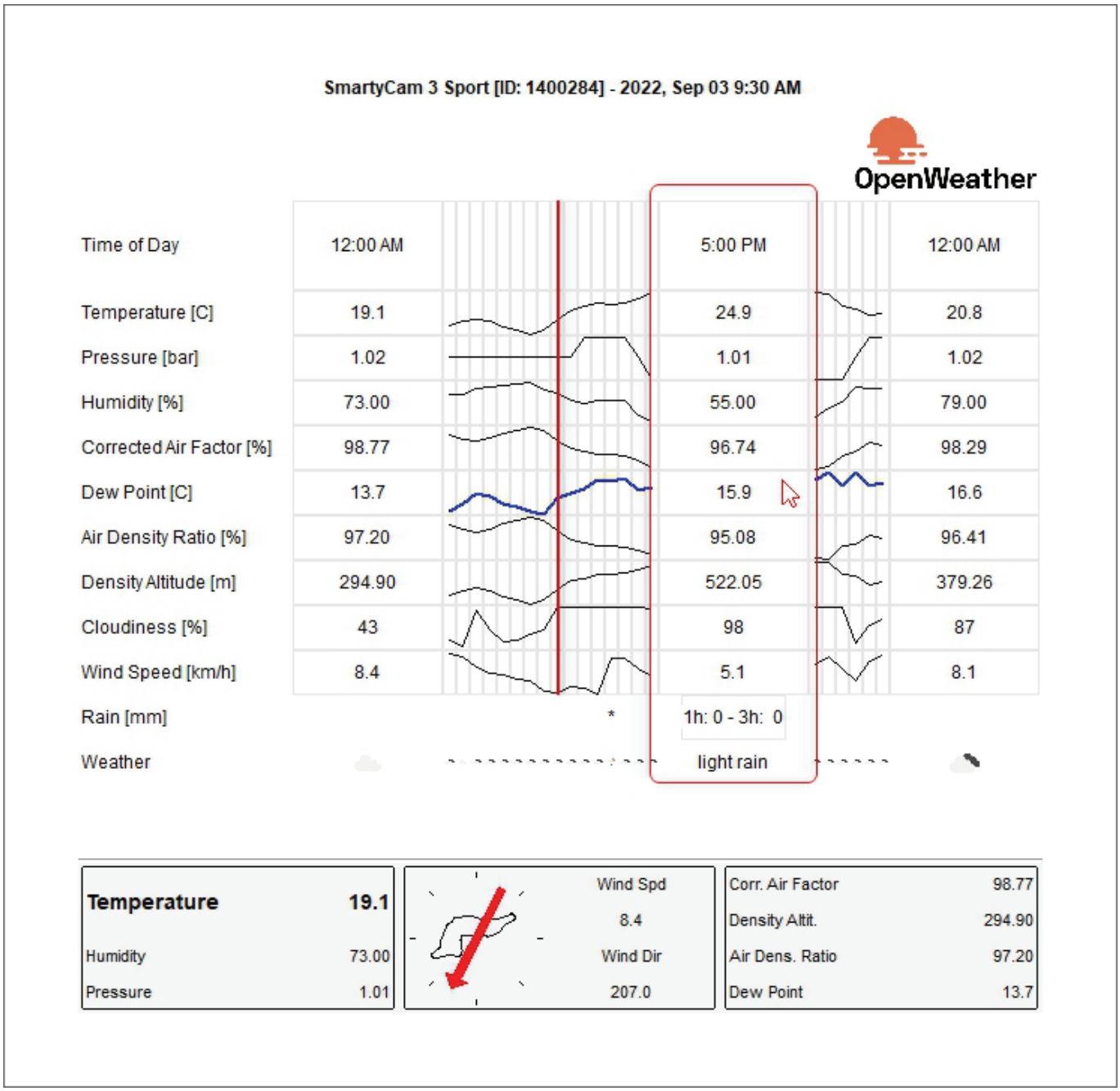


2.4.5 – Weather preview

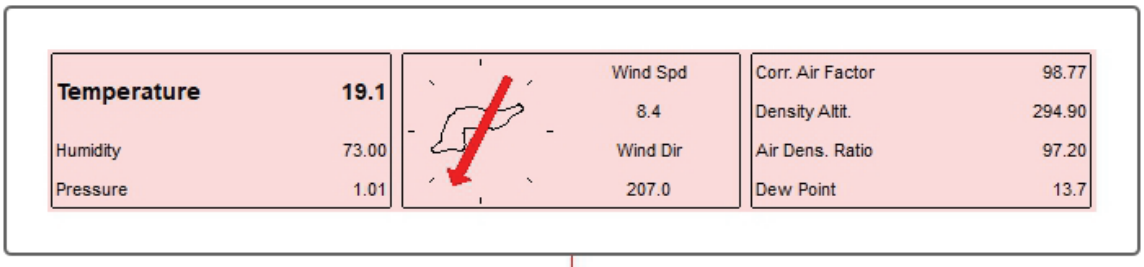
The weather preview shows all information about the weather conditions in the date of the race, from midnight to midnight.
Please note: these information are available for 12 months from the day they are recorded only.

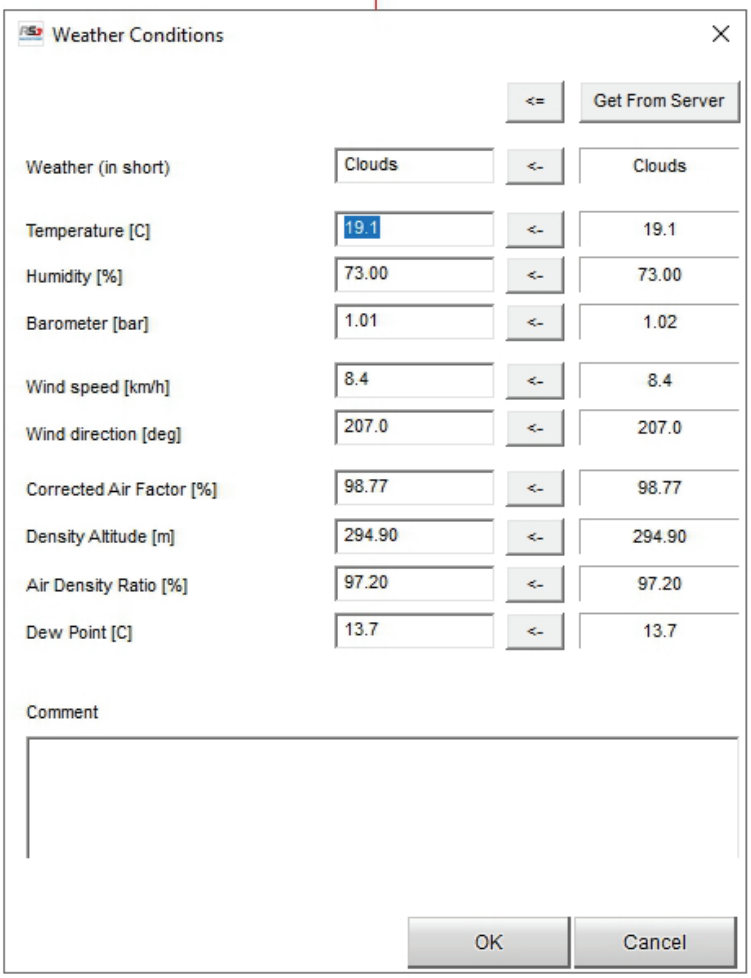


Mousing over the graph the weather conditions during the day are shown.



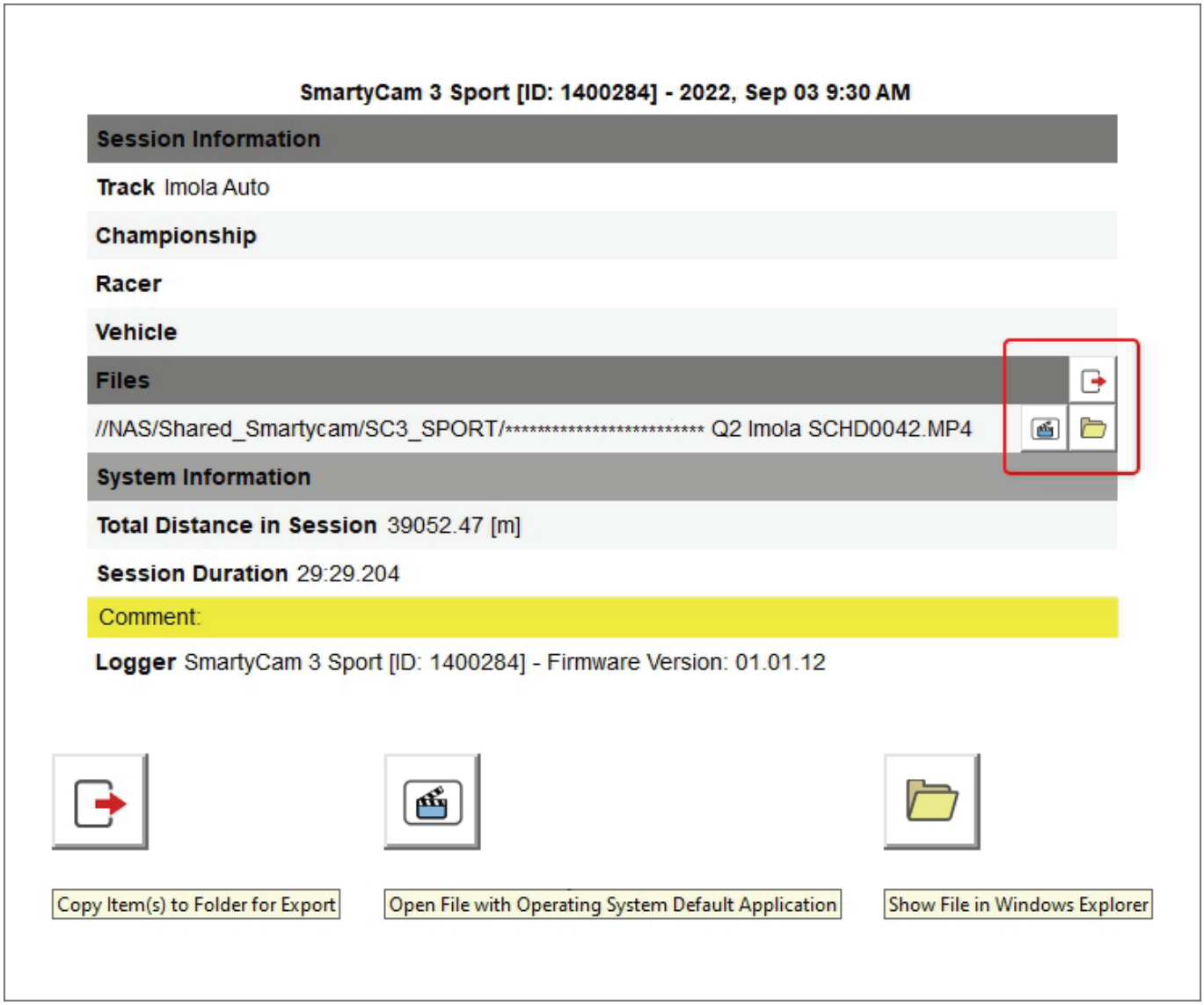
Weather information come from AiM server that connects to the nearest OpenWeather station according to your GPS coordinates. Double clicking on the panels bottom of the preview a weather conditions panel is prompted. If you have more accurate information here you can fill them in. In a second moment you can replace them (one or all) with the information coming from AiM server: use "<-" to replace the single information and "<=" to replace all information.





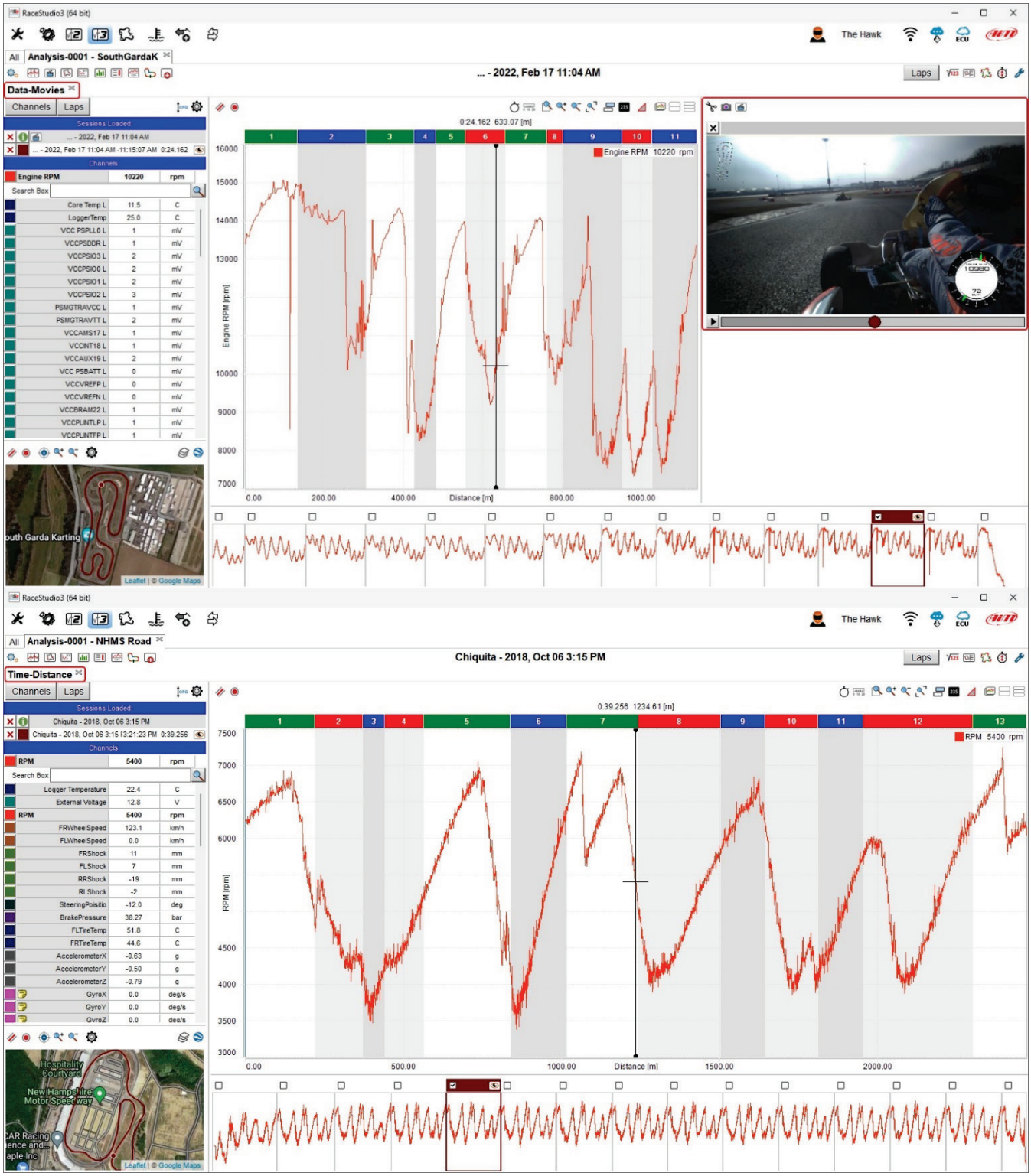
2.4.6 – Advanced Info preview

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 file in Windows 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.

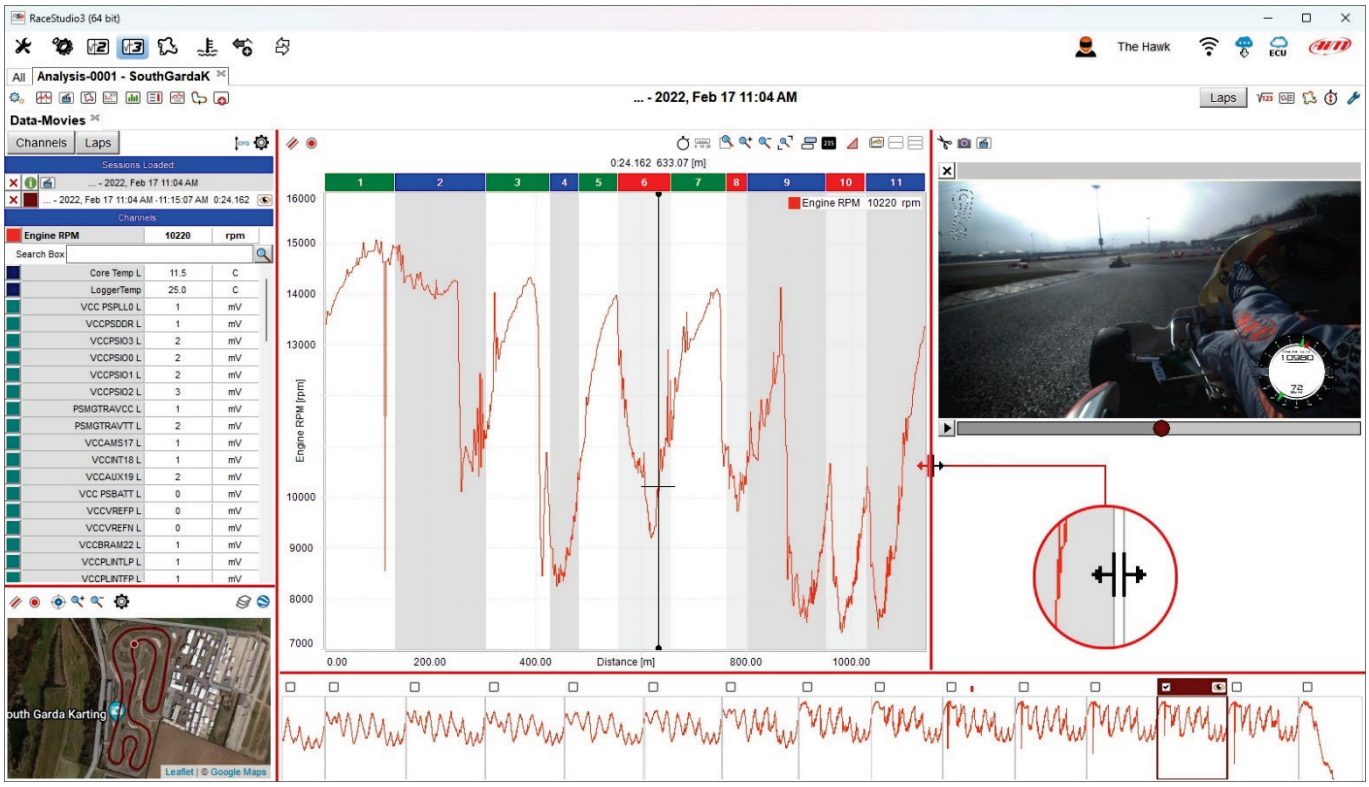


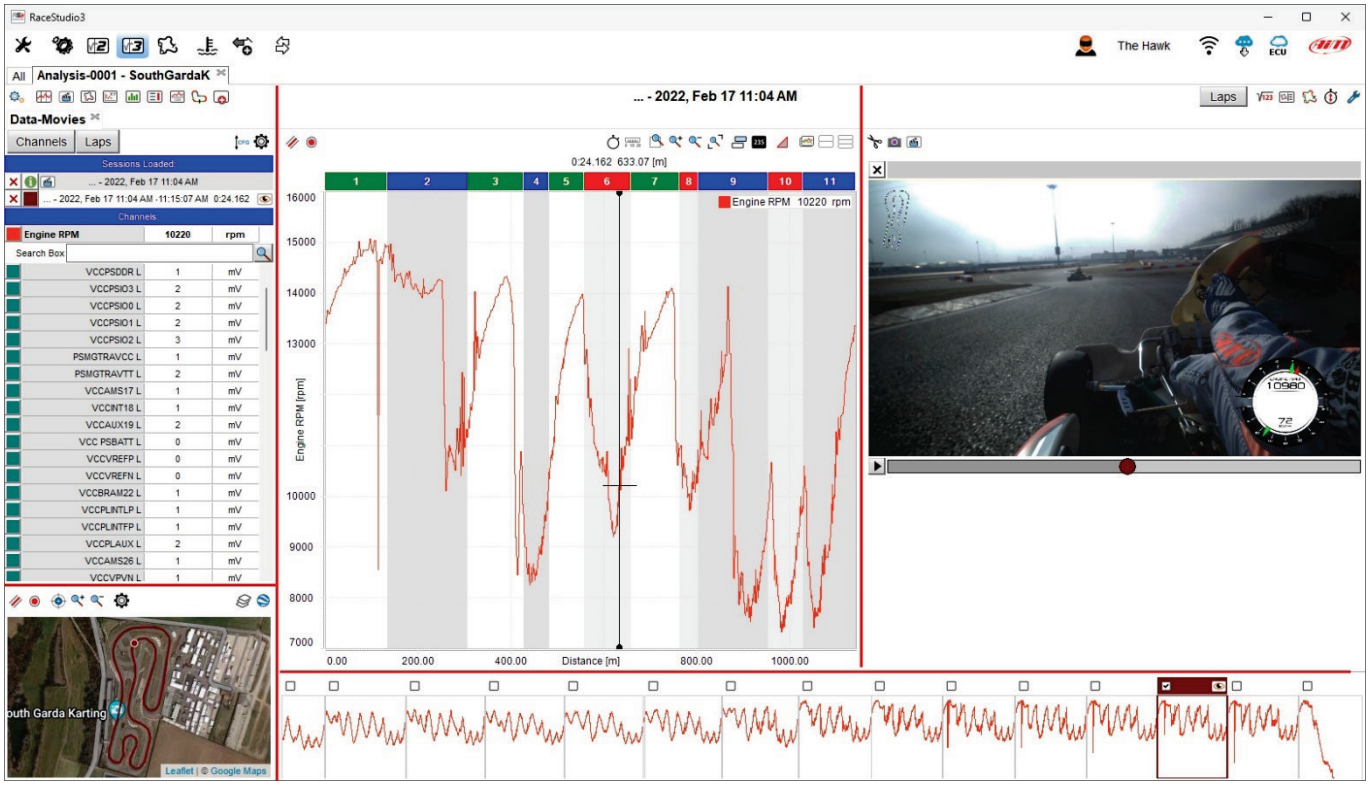
3 – Analysis views

Double click on a file to open and start analysing it. “Analysis” view opens. The default view changes depending on the presence (top image) or not (bottom image) of a video in the file. In the second case “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.

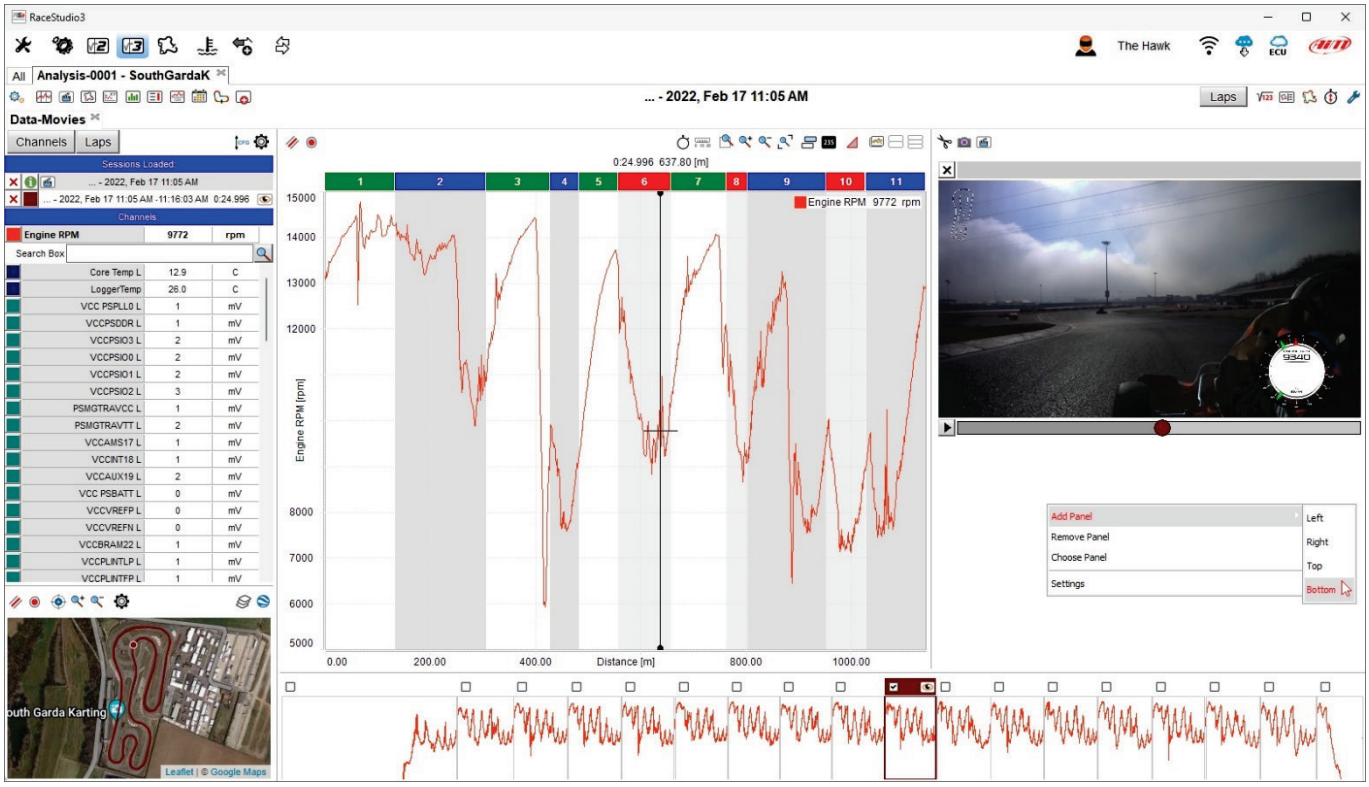




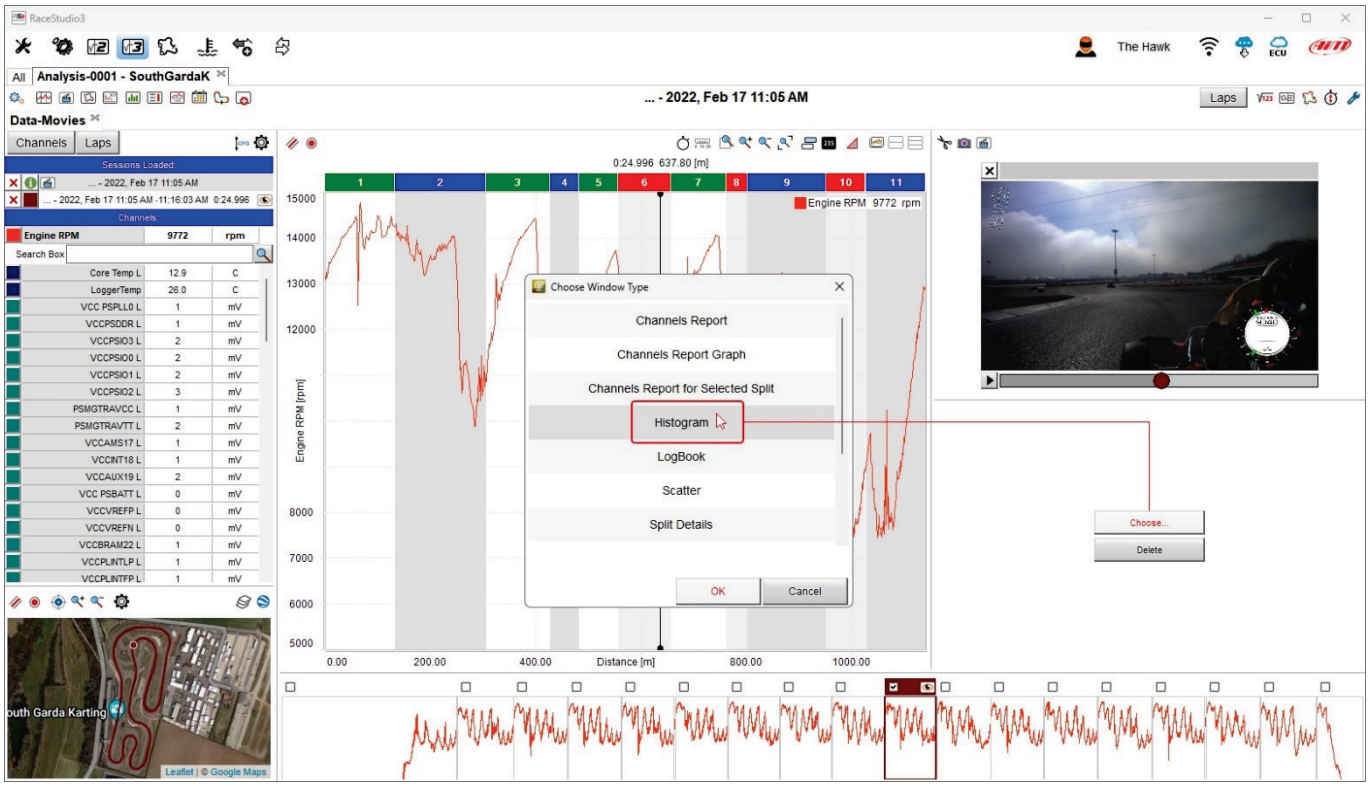
3.1 – Add/removing a panel to/from the software view

To **add** a panel:

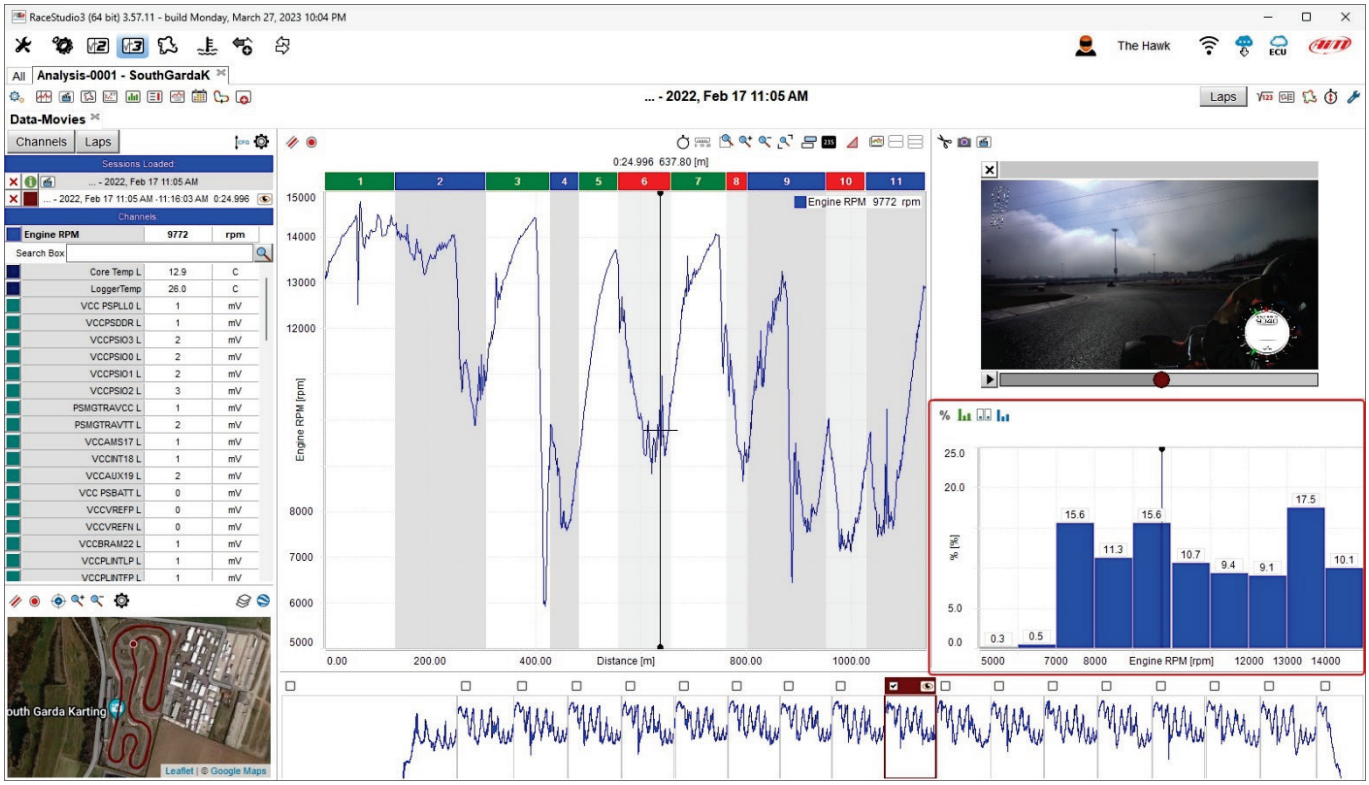
- right click on the view
- select “Add Panel” option
- select the desired position (bottom in the example)



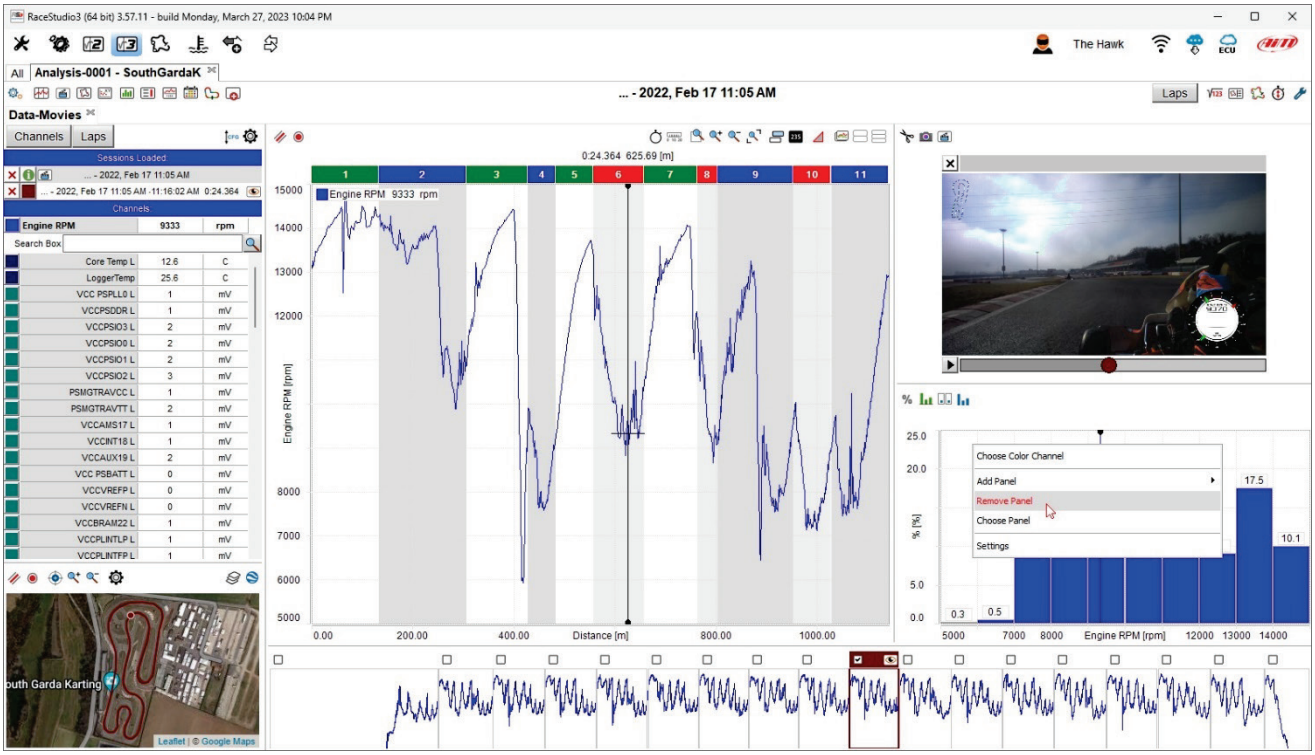
Choose the window to add in “Chose window type” dialog window (histogram in the example below).



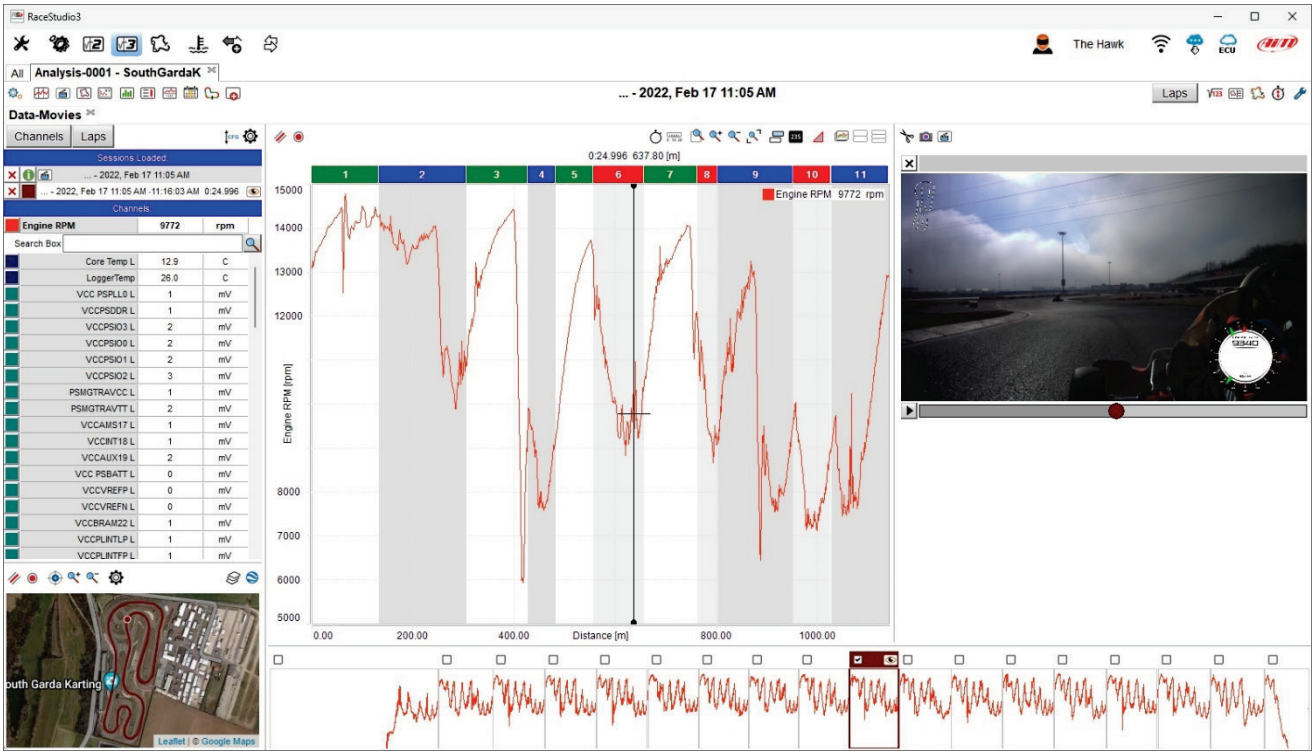
Press “OK” (image above) and the window is added (image below).



To **remove** a window place the mouse on the window to remove right click on it and select “Remove Window” option.

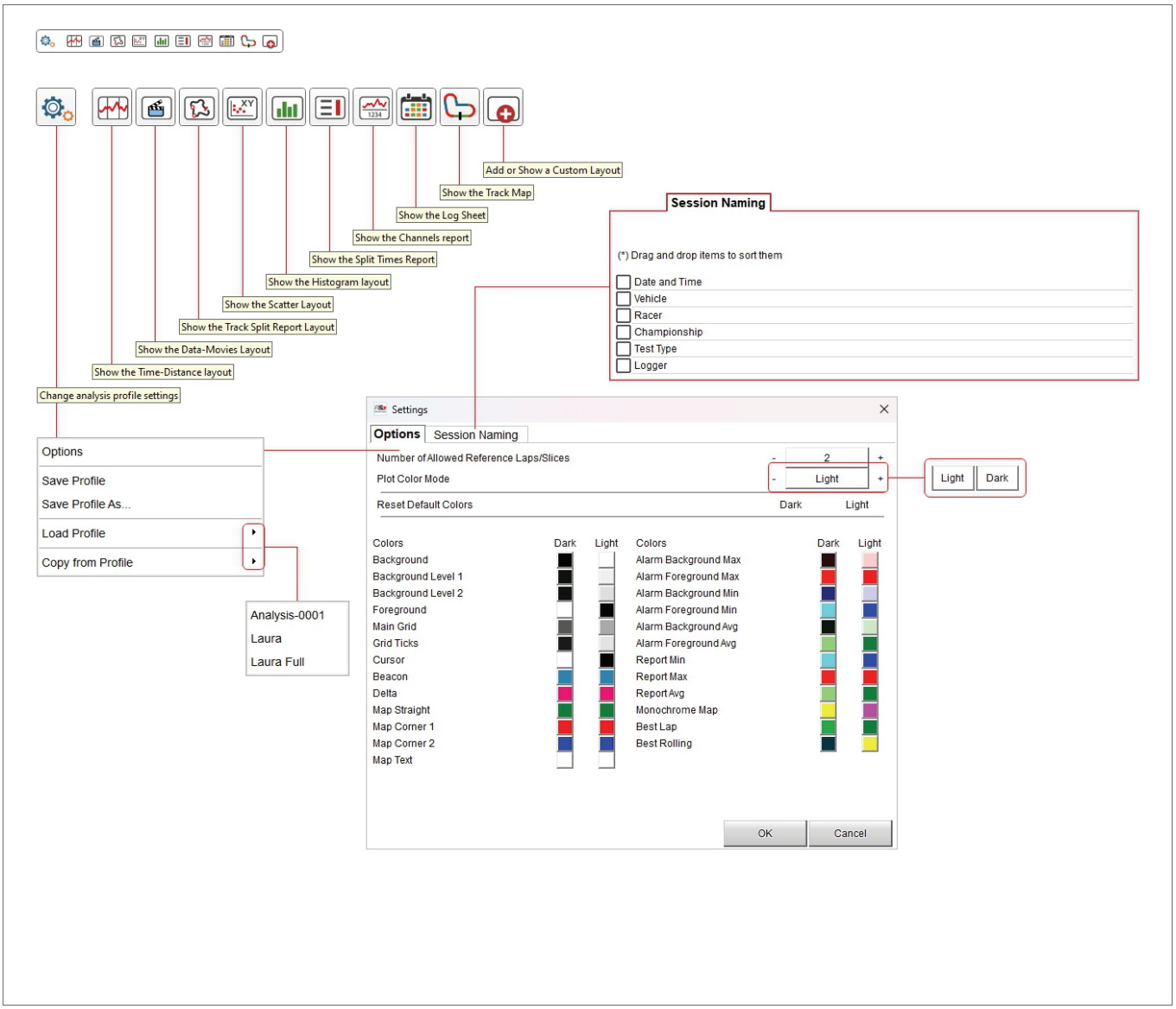


- the window is removed



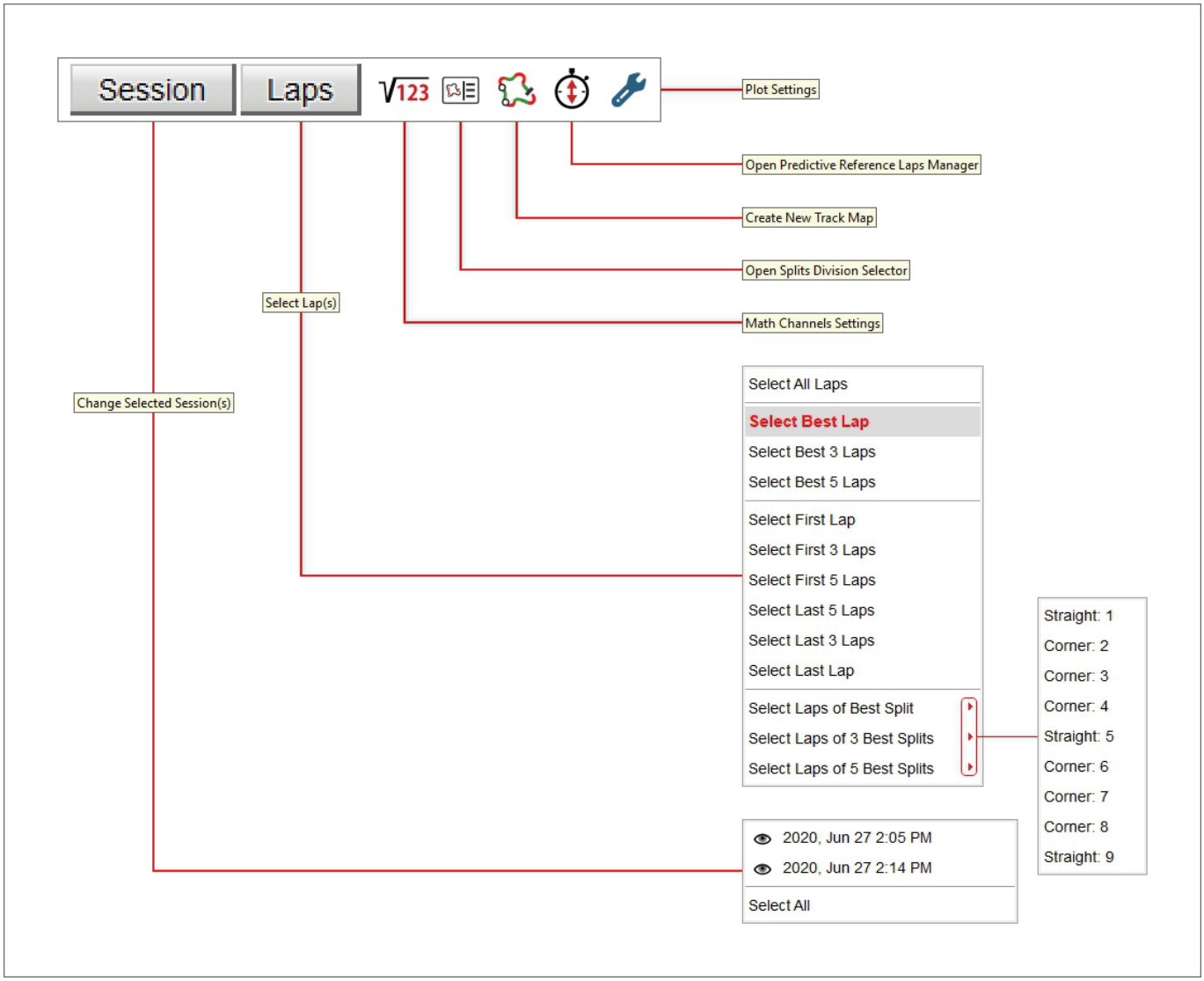
3.2 – The software top keyboards

The analysis view features two top keyboards (left and right) that changes its layout. Here below is **top left keyboard**. All functions are explained in chapter 4.



Session naming panel allows the user to name a session sorting its characteristics in a preferred order.

Top right keyboard is shown here below.

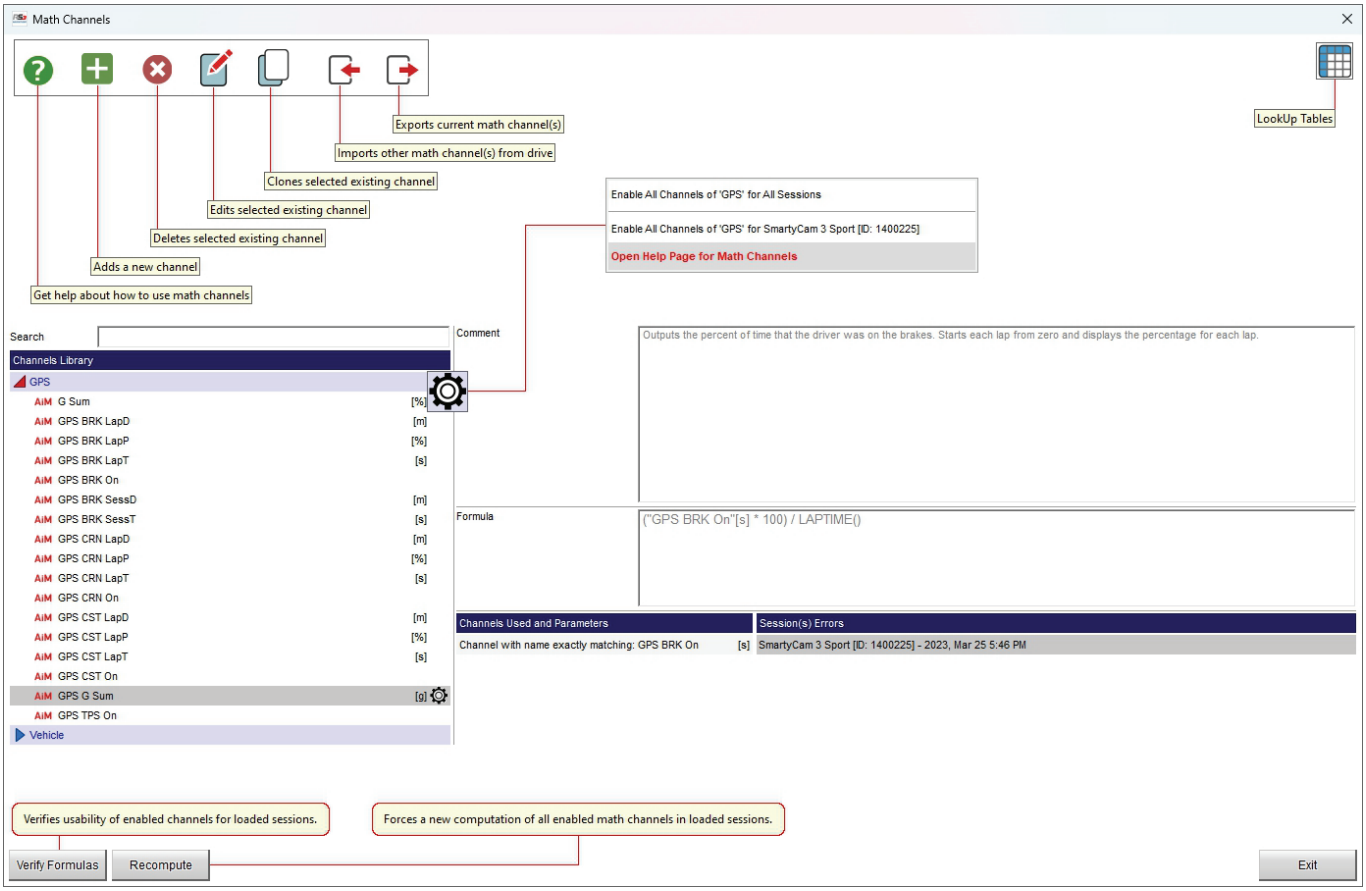


The right keyboard buttons are for:

- **Session**: selecting one or all open sessions
- **Laps**: selecting the laps to show in the selected layout:
- **Math channels settings**: recalling Math Channels panel (see paragraph 3.2.1)
- **Open Splits Division Selector**: recalling track map split panel (see paragraph 3.2.2)
- **Create new track map**: recalling a panel that allows to create a new version of an existing track map (paragraph 3.2.3)
- **Open predictive reference lap manager**: managing predictive reference laps (paragraph 4.2.1)
- **Plot settings**: recalling the corresponding dialog window (paragraph 3.2.4)

3.2.1 – Math Channels Settings

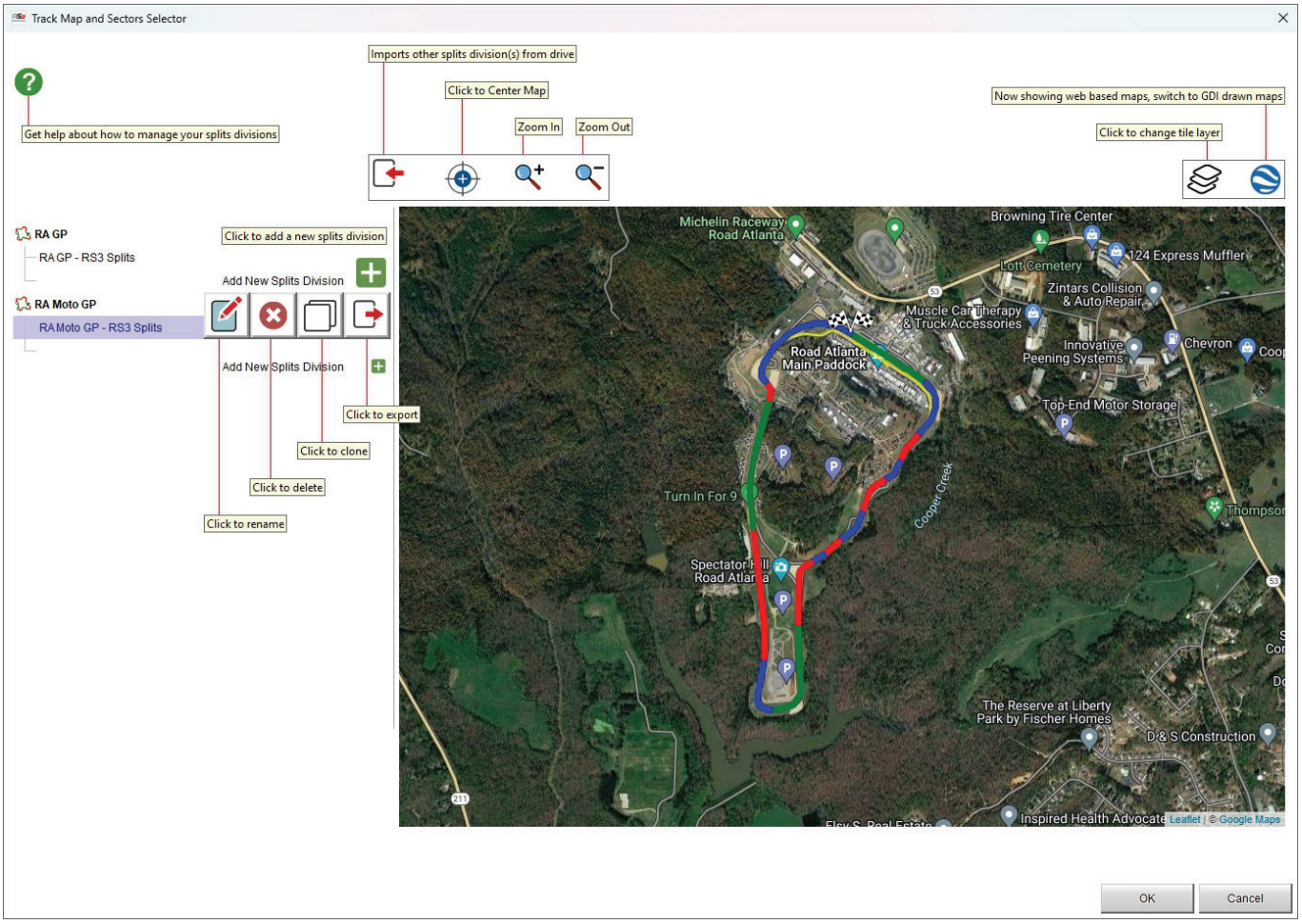
Pressing the icon above Math channels panel setting is prompted. Here below all buttons are explained.



Selecting "Open help page for math channels" the software re-directs you to an online help page that is being completed. This function is better explained in chapter 14.

3.2.2 – Split division selector

Pressing this icon above Track map and sector selector panel is prompted. Here you can manage this division as shown below.



As for any track map you can import the split division from the device, centre and zoom it in/out using the top left keyboard as well as decide the map tile provider and switch among web mapping and GDI drawn map using the top right keyboard.

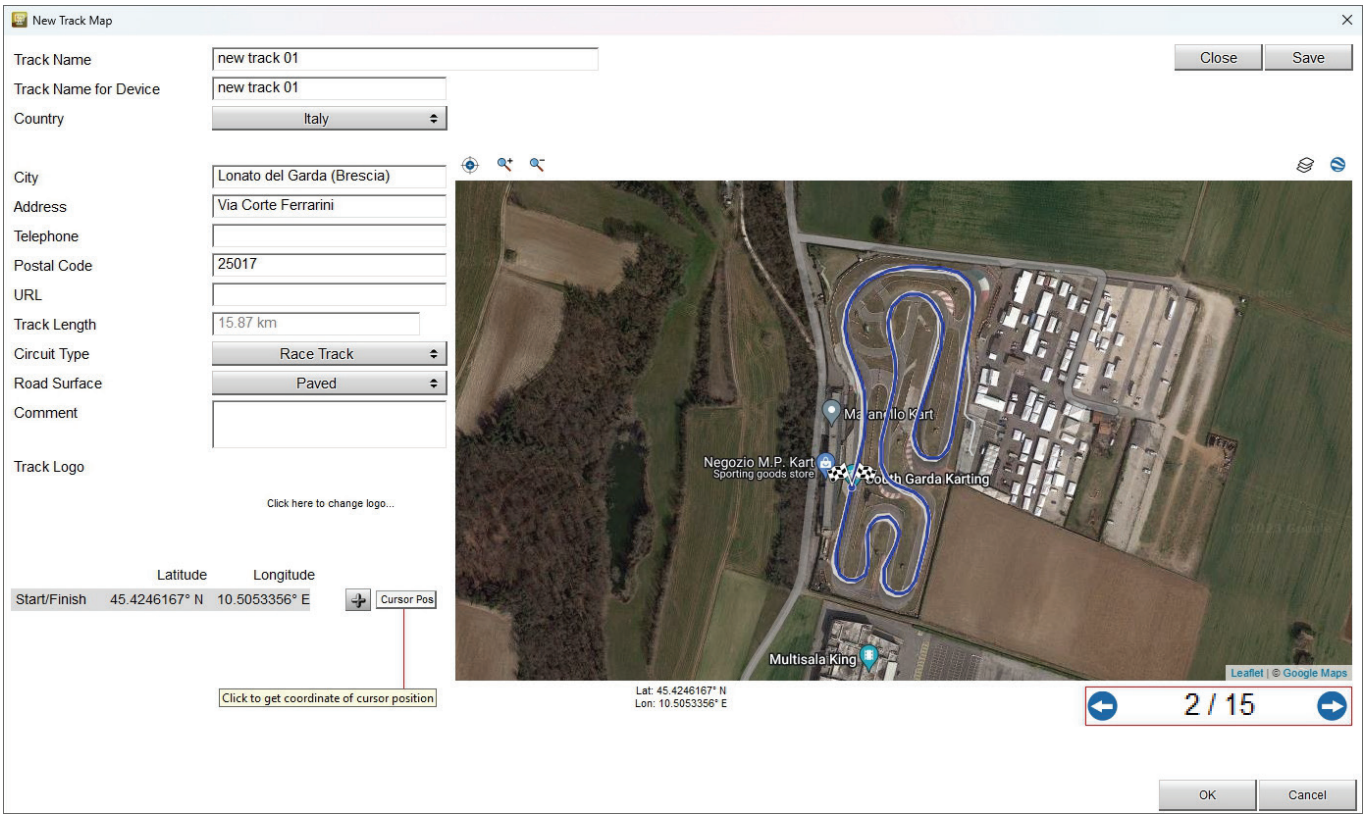
Split division can be renamed, deleted, cloned and exported using the icons that appears mousing over the splits.

Please note: clicking the question mark top left of the software panel you are re-directed to an online software help page.

3.2.3 – Create a new track map

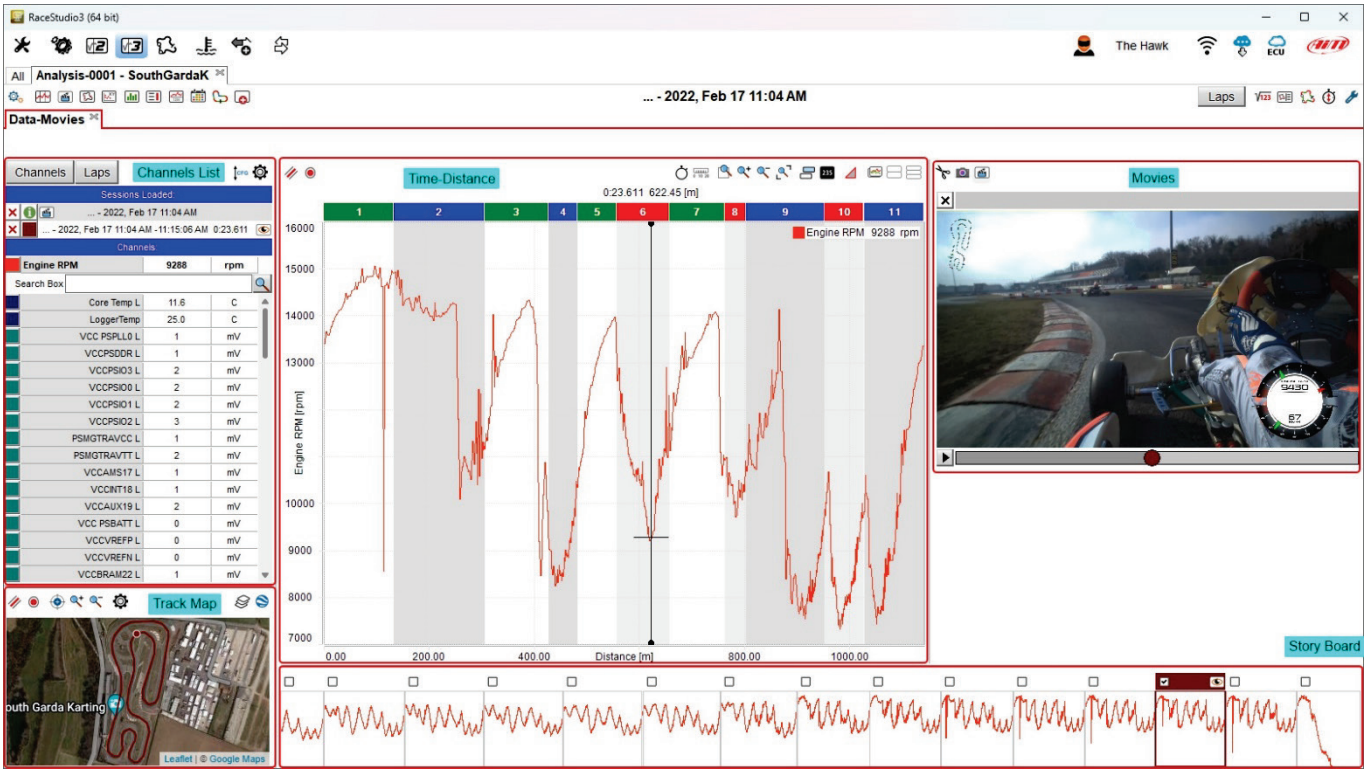
Clicking the above showed icon it is possible to create a new track map from available data. Bottom right of the panel all available track laps are shown: scrolling them it is possible to select the one to use to create a track map.

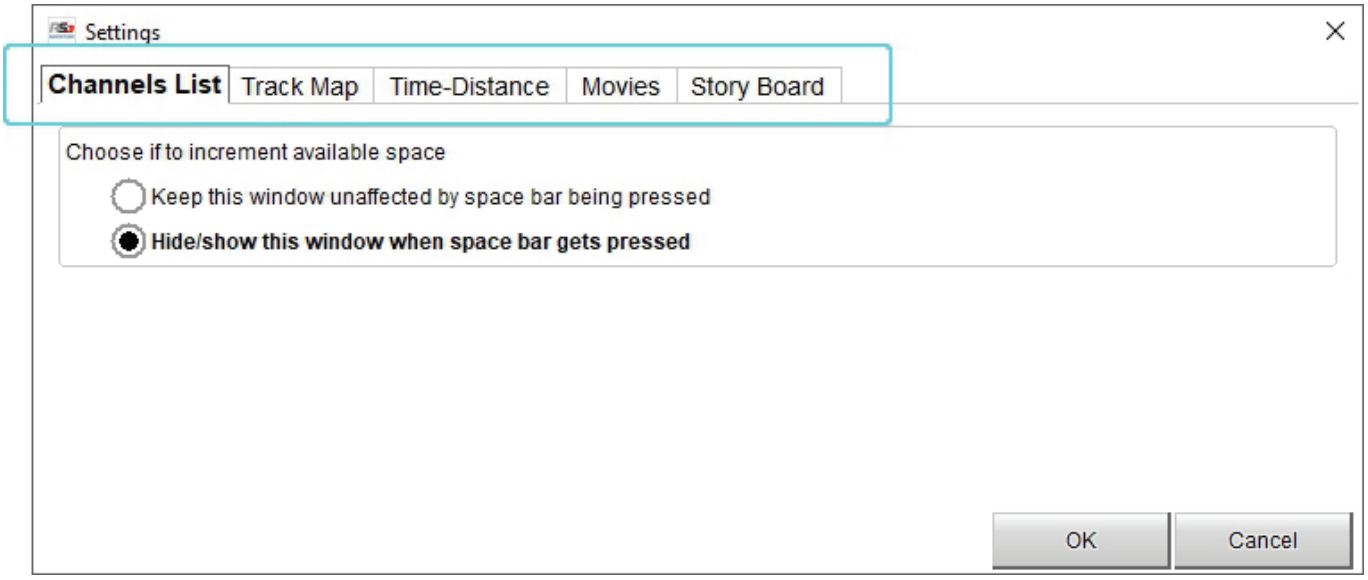
Pressing the bottom left "+" button you can add new splits.



3.2.4 – Plot settings

Using the icon shown here above you can decide plot settings of all the panels included in a view. Each panel has its setting tab.

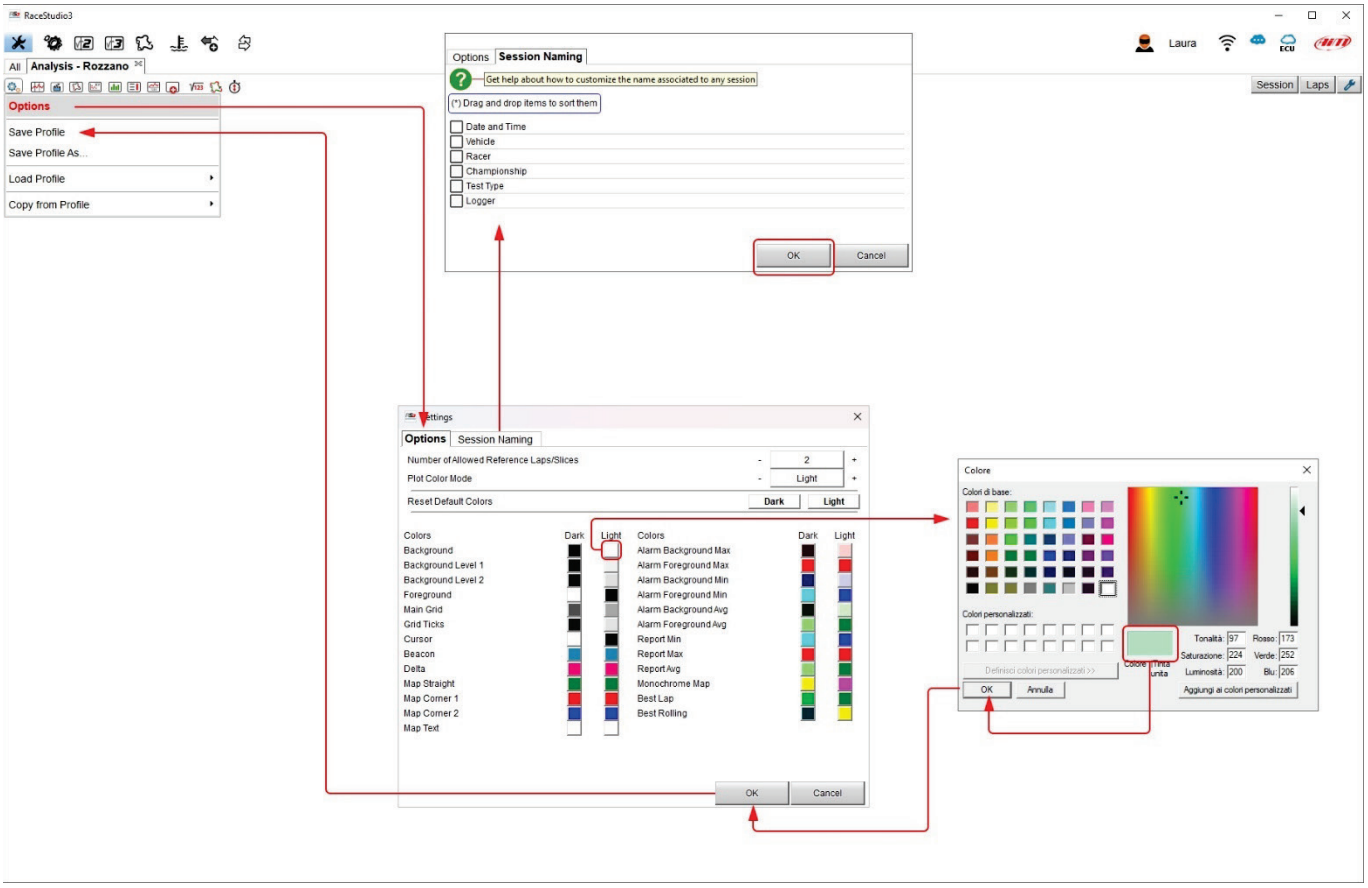




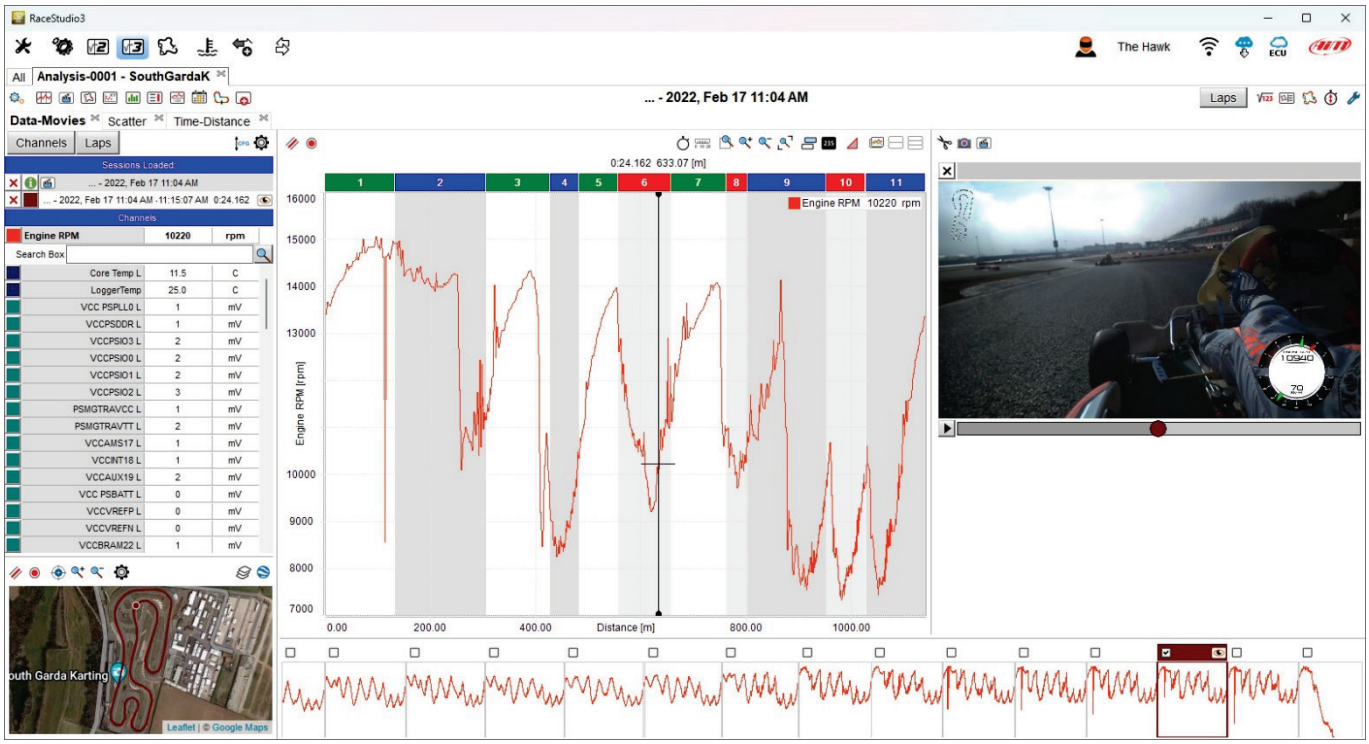
3.3 – View Options and Profiles

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

- click the setting icon shown above and select “Options”: a “Settings” dialog window is prompted
- to switch from Light to Dark plot mode press the related buttons;
- 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 box
- a colour palette appears
- select the desired colour or move the pointer in the nuanced palette
- the result appears bottom of the nuanced palette
- with “Session Naming” panel it is also possible to name a session sorting its characteristics in a preferred order dragging and dropping them; clicking the question mark you reach an online help page.
- press “OK” on both “colours” and “Settings” dialog window
- click again the setting icon top left of the view, select “Save Profile” and name the new profile
- from this moment the selected test will be shown with the new settings and it can be recalled selecting it in the list of “Load profile” menu

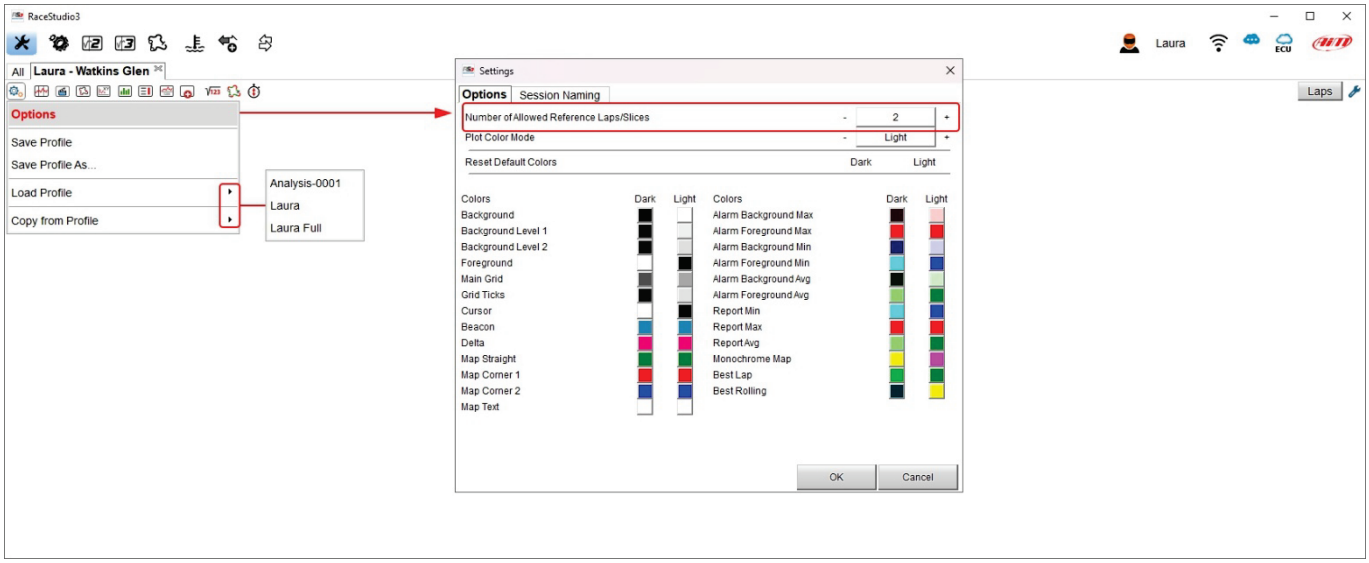


The images here below show a default view on top custom profile bottom.



Profiles can be loaded, 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 load, clear, export or share. Any operation can be performed on one only profile at a time.

Top 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 from 2 to 8; this means that opening more than the fixed number of reference laps, channel tags (see paragraph 4.3.1) on the central graph and movies are shown only for the number of reference laps/slices here fixed.

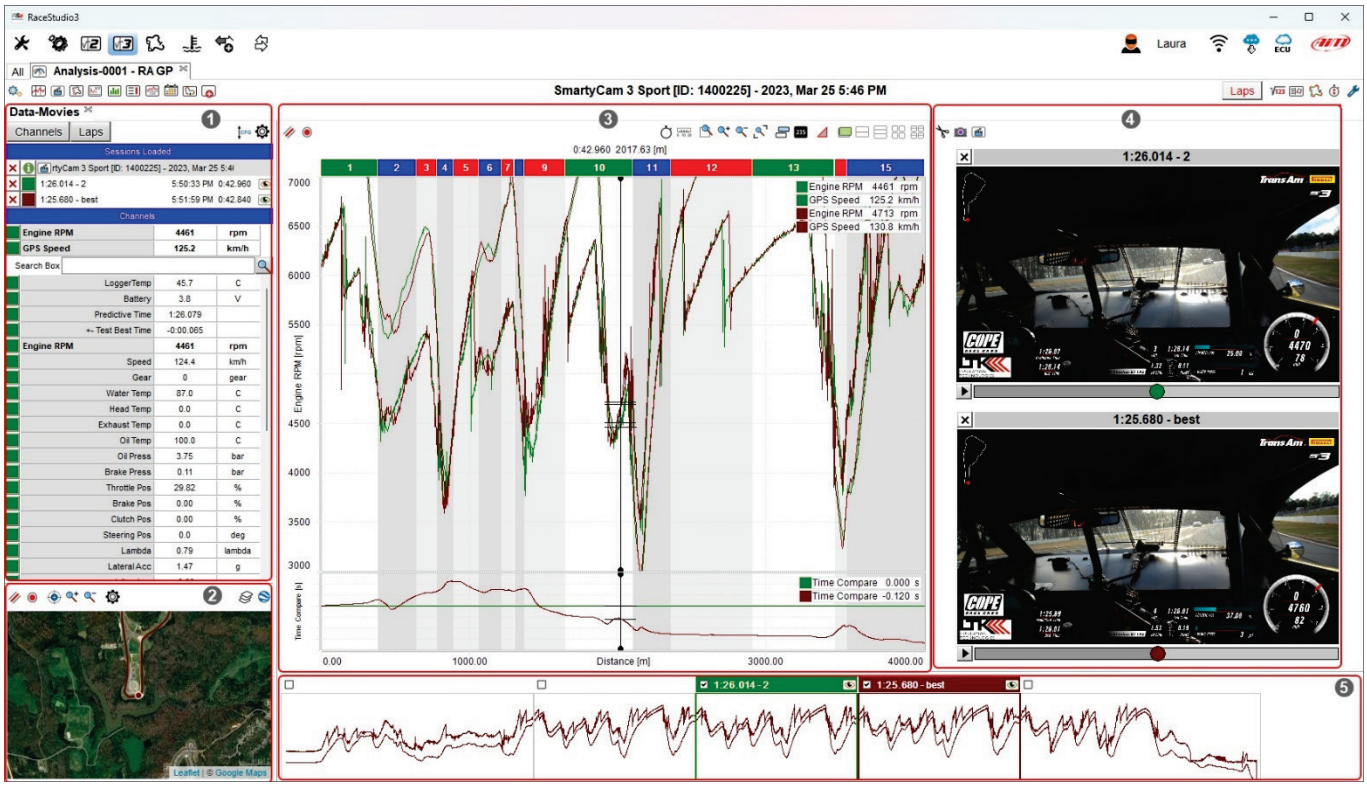


4 – Data-Movies layout

This layout is the one opened by default 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, exception done for the graph dialog window (**3**) that changes according to the layout you select.
Data-Movies layout shows:

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

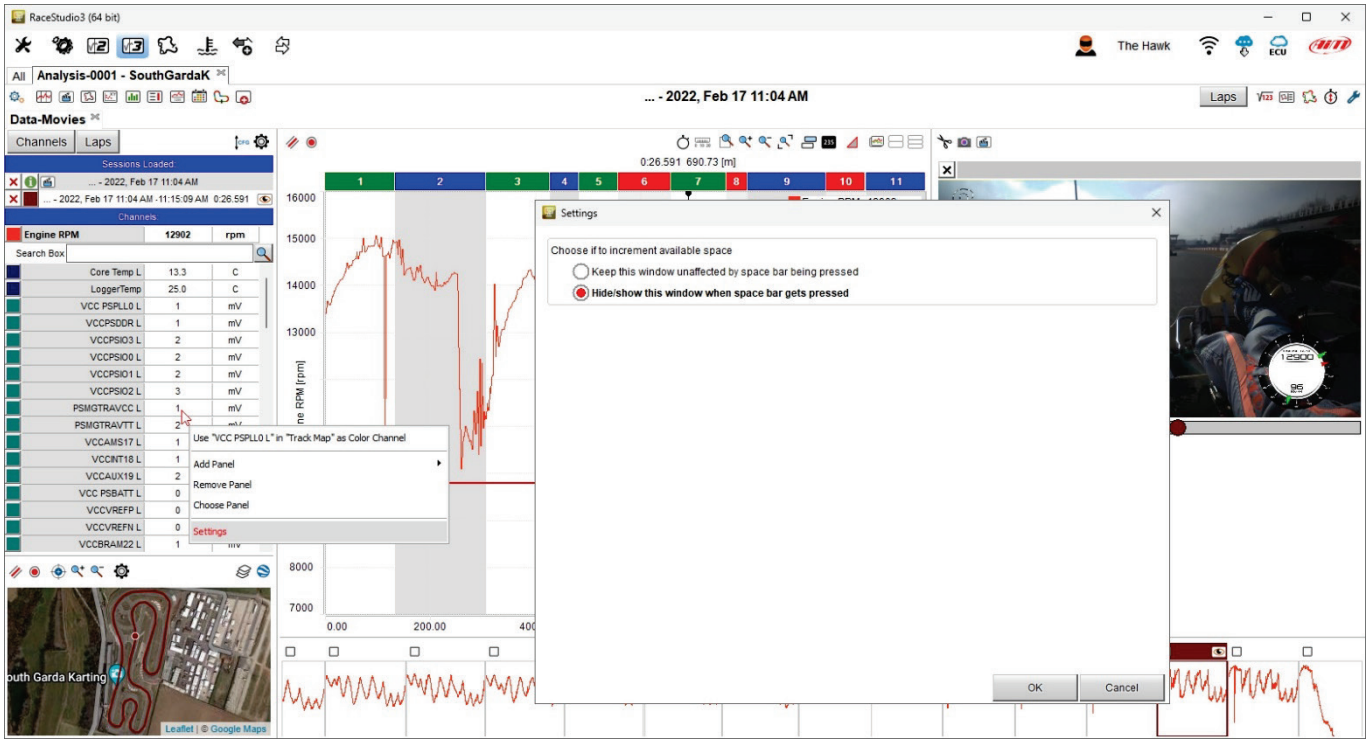
Each panel of the layout is explained in the following paragraphs.



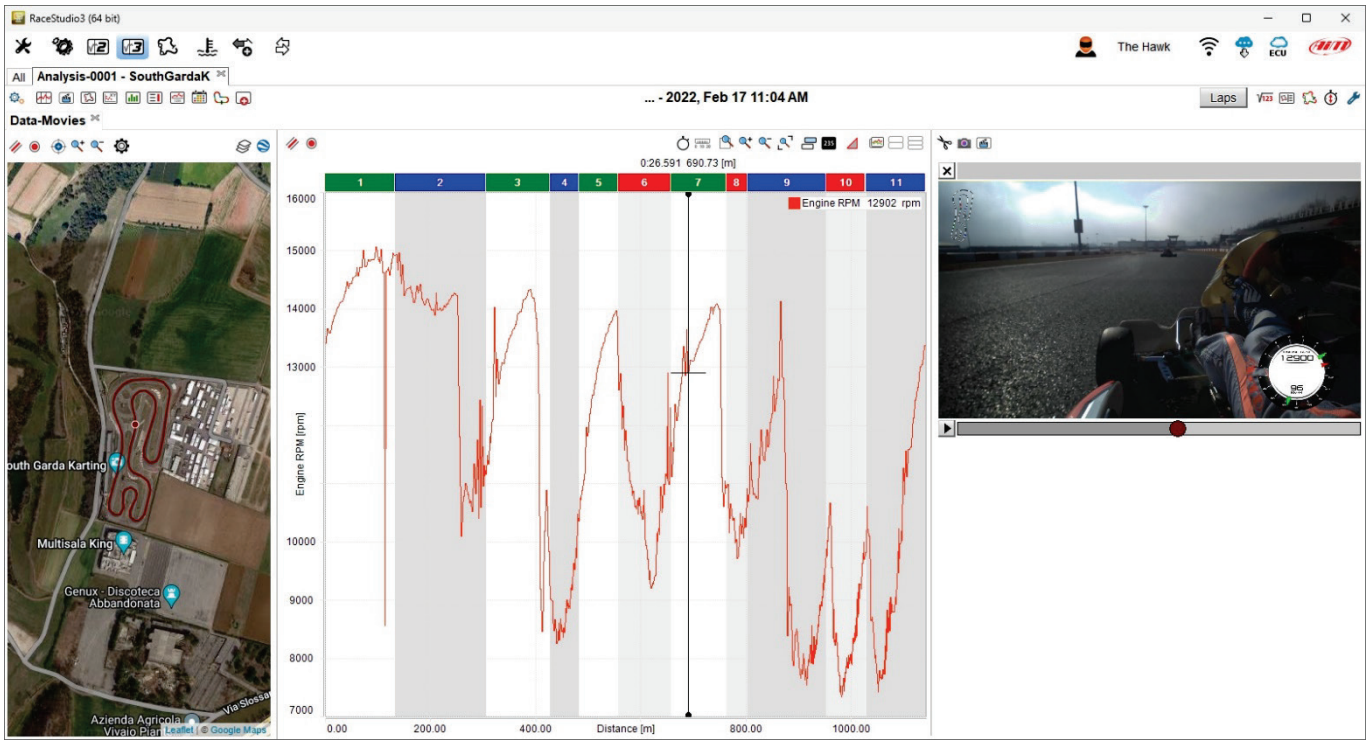
4.1 – Showing/Hiding a panel from the software view

Any panel can be shown/hidden pressing the space bar. To enable this function:

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

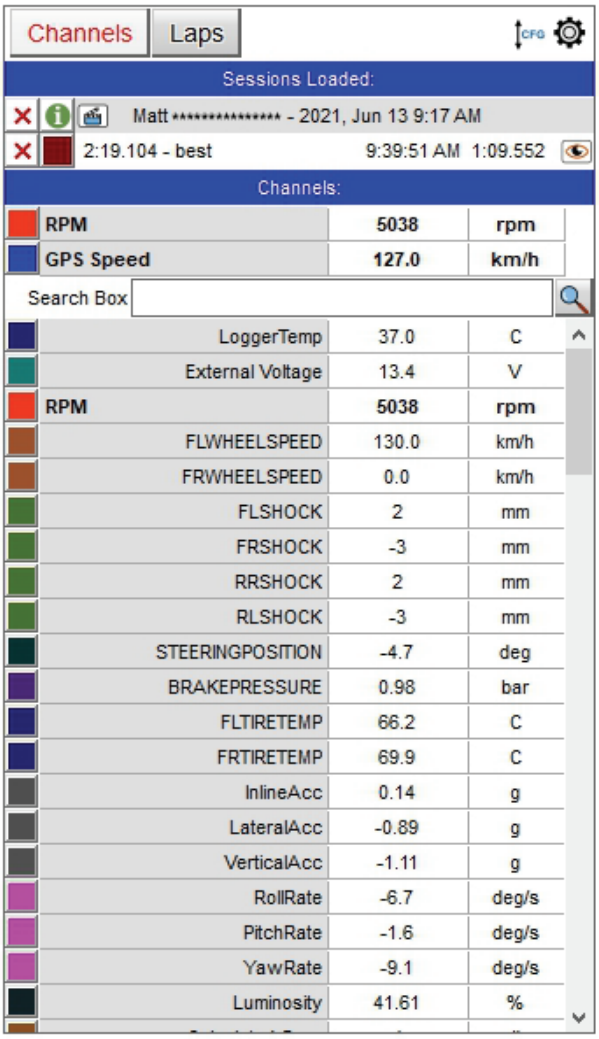


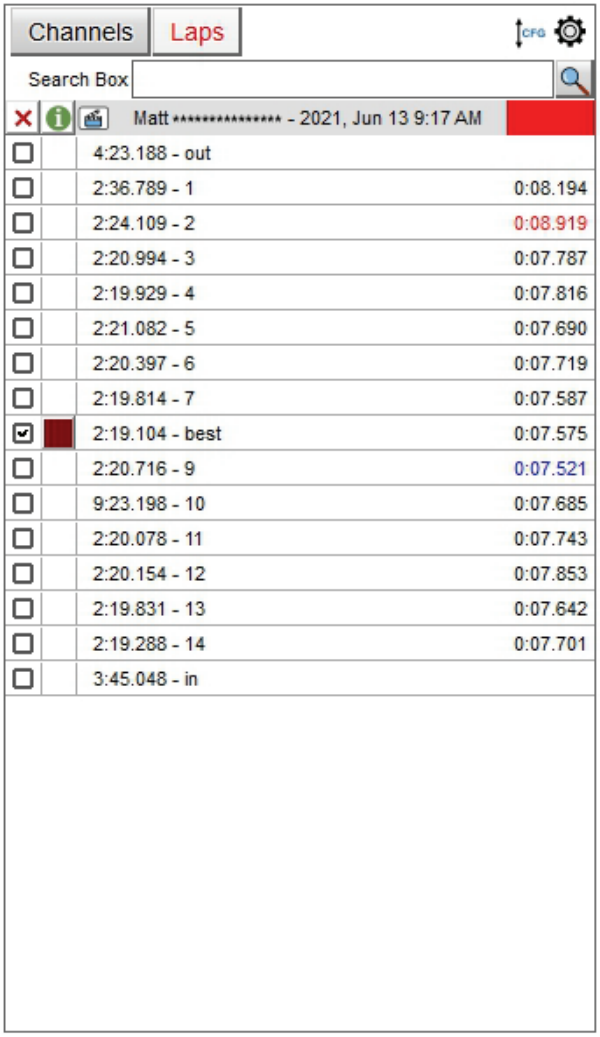
Once the setting fixed, the panel is shown/hidden when the space bar is pressed; in the image below we fixed this setting on “Channel table” panel that is in effect hidden.



4.2 – Table of Channels and table of laps

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





Channels view

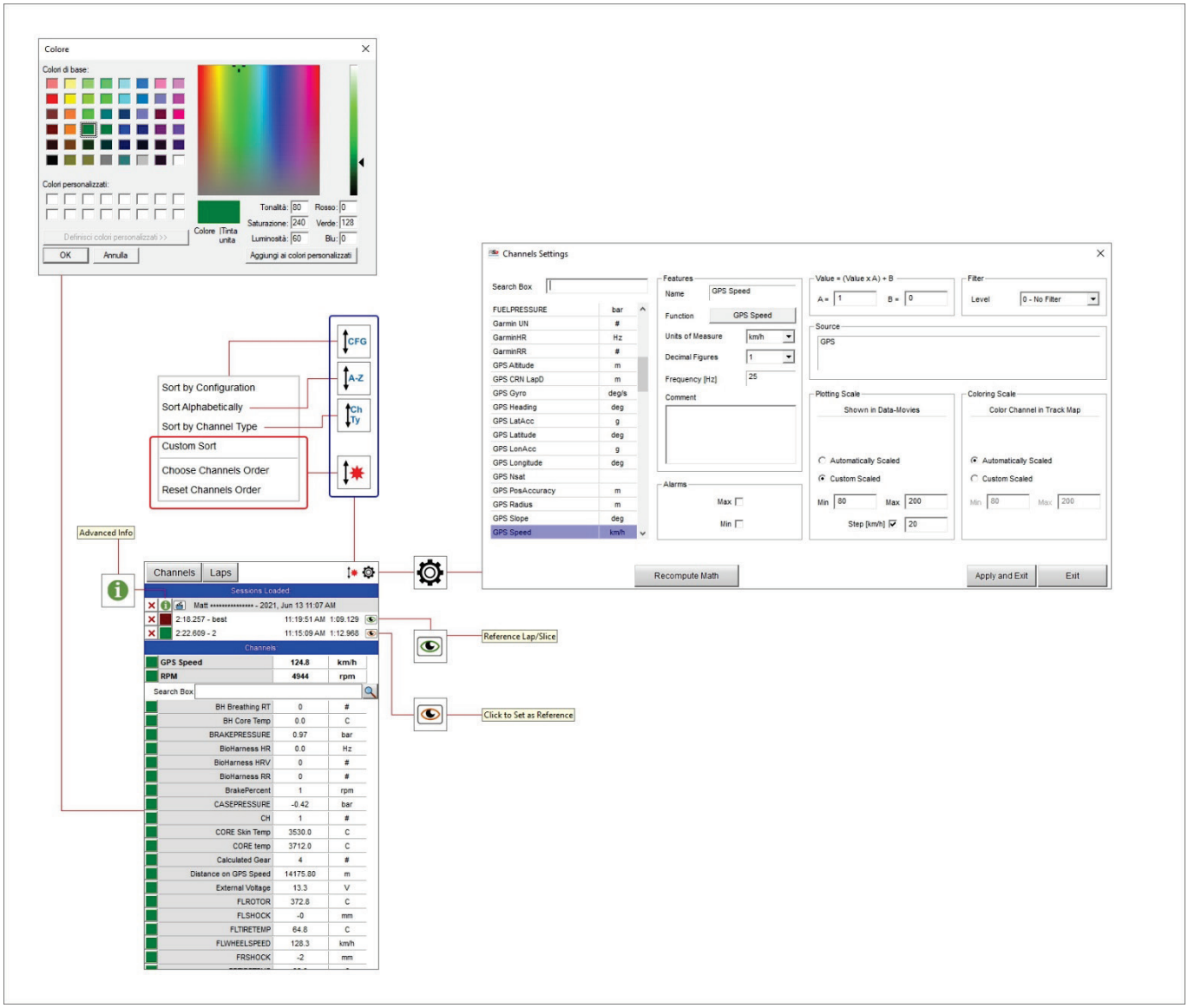
With reference to the image below, top right of the view are **two buttons** that allow to:

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

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 if available and speed), a search box (indicated by the magnifying lens) and bottom of it all the available channels.

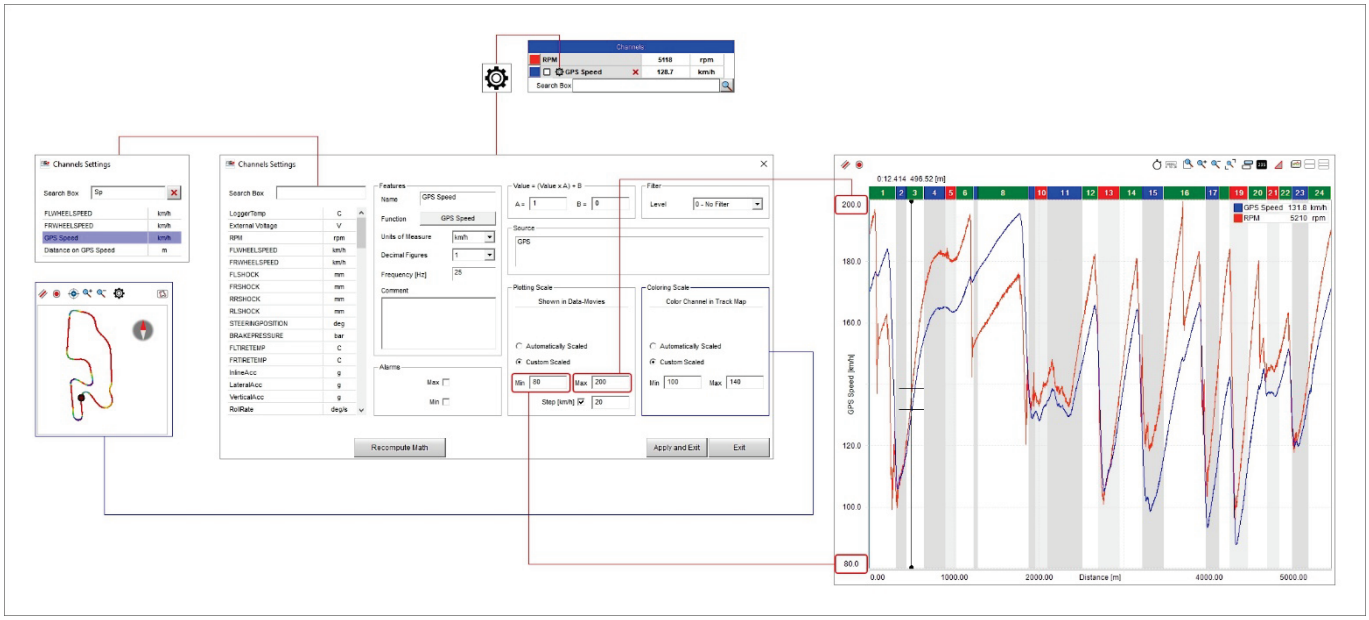
Mousing over any of the channel plotted in the graph a setting icon and a red cross appear in the corresponding box. The red cross is to delete the channel from the central graph while the setting icon allows to set it and recalls the related dialog window with the channel you are setting already selected.

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



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

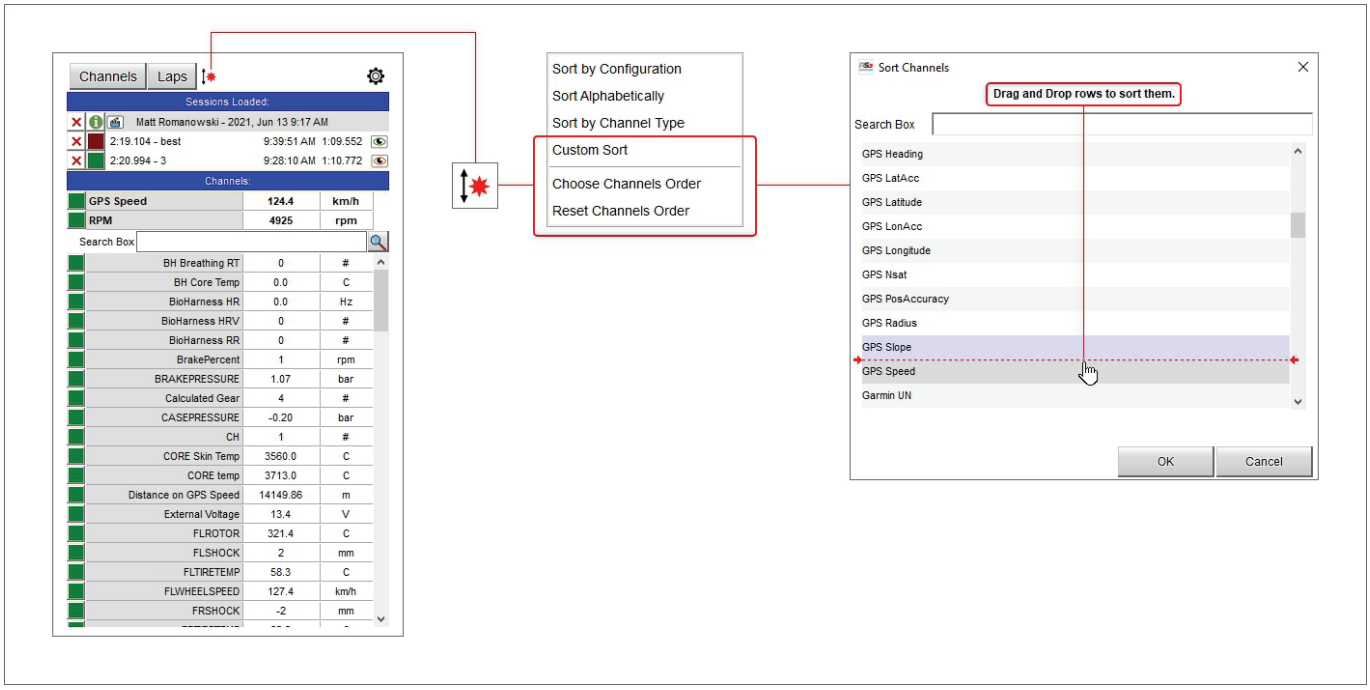
- look for a channel typing it in “Search” box: the system makes an automatic selection
- change the unit of measure, the number of decimal figures and the sampling frequency
- insert a comment about the data
- to set an alarm for max and min values of the channel
- correct a channel that has been wrongly set and cannot be reset in “Value” box
- can filter the noises using different levels of filter
- specify the source of your (GPS in the image below)
- use an automatic or custom plotting scale; in the second case a range of values is needed
- colour the channel in the track map using max and min values as reference with “Colour per lap/slice” setting.



To custom set the channels, select the option “Custom Sort” and the two additional related voices are prompted:

- Choose Channels Order and
- Reset Channels Order

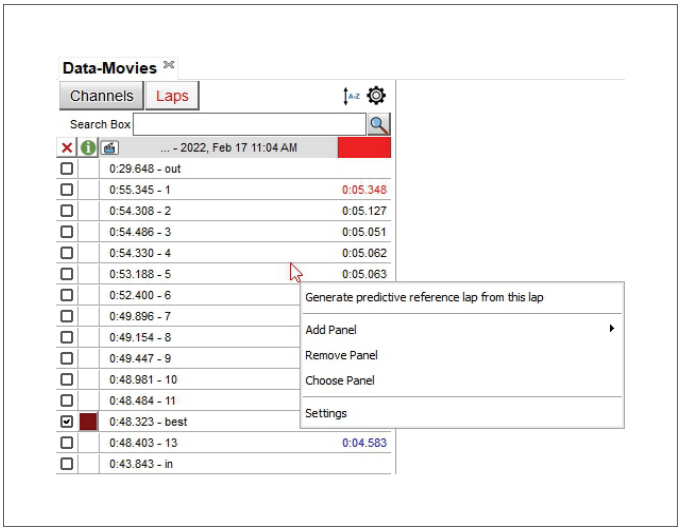
You can drag and drop the voices to custom sort them in the channel table or reset channels order selecting the related option.



Laps table

Laps table shows all laps of the session with the best one indicated by default. Right clicking on a lap time a menu is prompted you can:

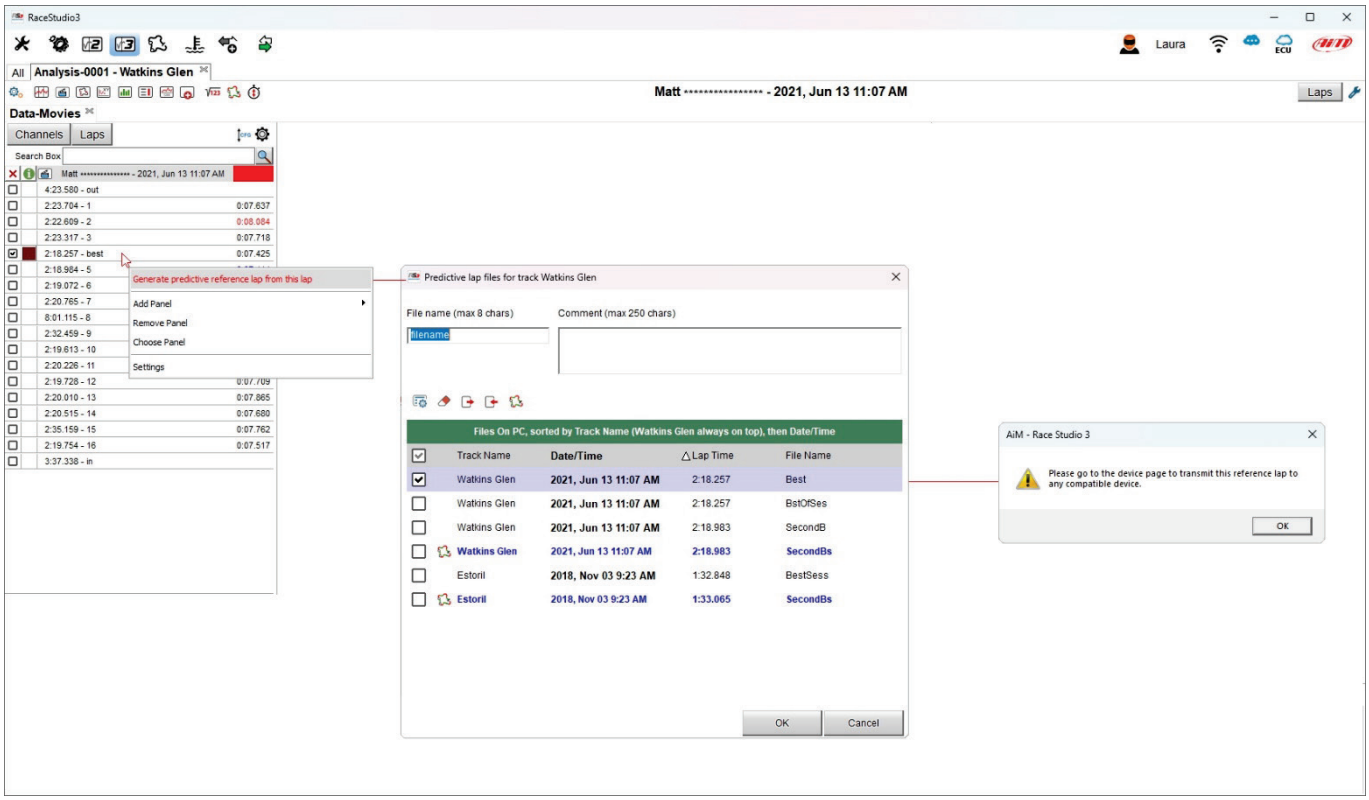
- generate predictive reference lap from it
- add/remove panels
- choose the current panel content
- enter Setting options of this panel



4.2.1 – Generating a predictive reference lap from a recorded lap

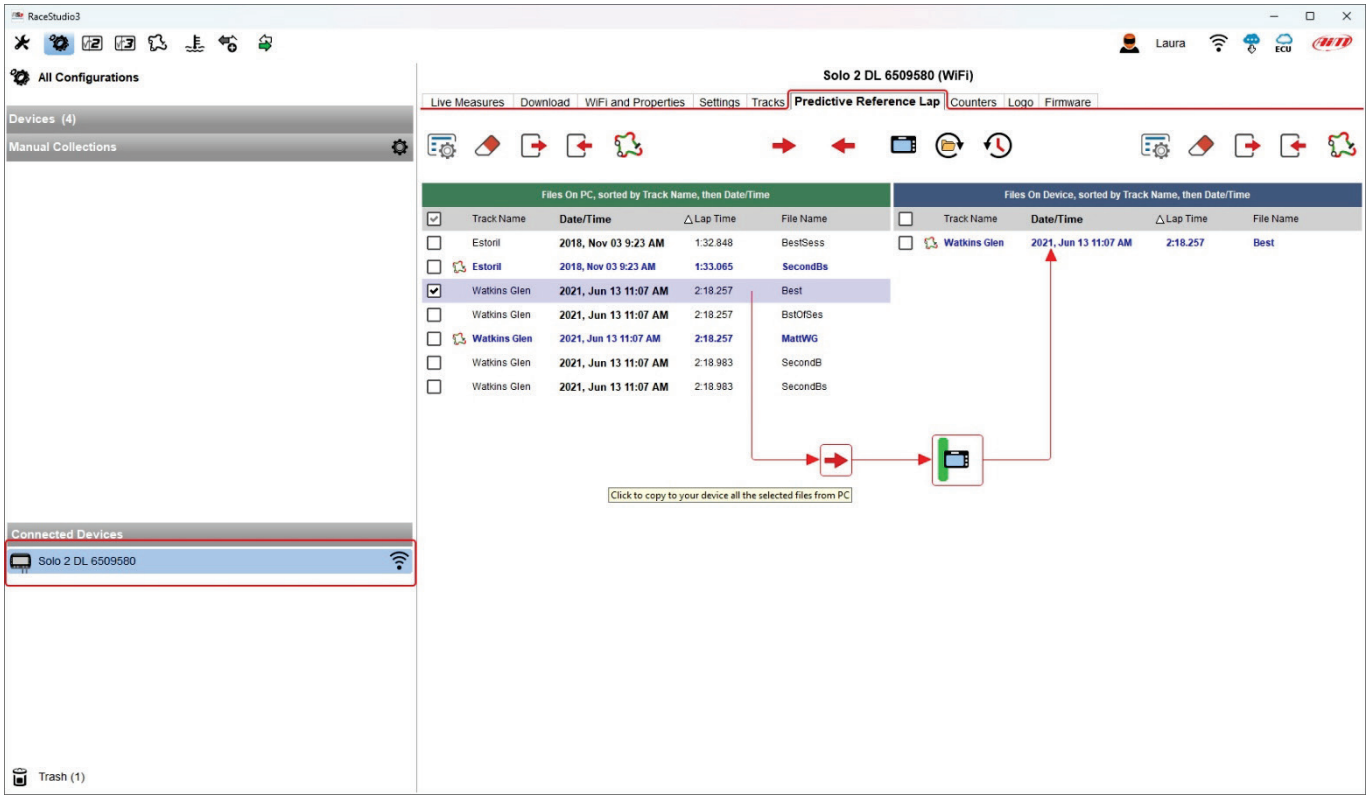
To create a predictive reference lap from a recorded lap follow these steps:

- right click on the lap and select “Generate predictive reference lap from this lap”
- a dedicated panel is prompted where all available reference laps are shown
- to add your lap enable it (is the first of the list)
- fill in “file name” and a comment if needed and press “OK”
- a new panel is prompted saying “Please go to the device page to transmit this reference lap to any compatible device”: press OK



Connect your AiM device to Race Studio 3 if it is not and:

- click on it bottom left on the software configuration page
- enter “Predictive Reference Lap” tab
- top of the tab are three keyboards: one on the left another central and the last one on the right
- select the lap to be used as reference
- press the first left icon on the central keyboard
- the software copies the lap to your device and you can fix it as reference for those devices that support this functionality

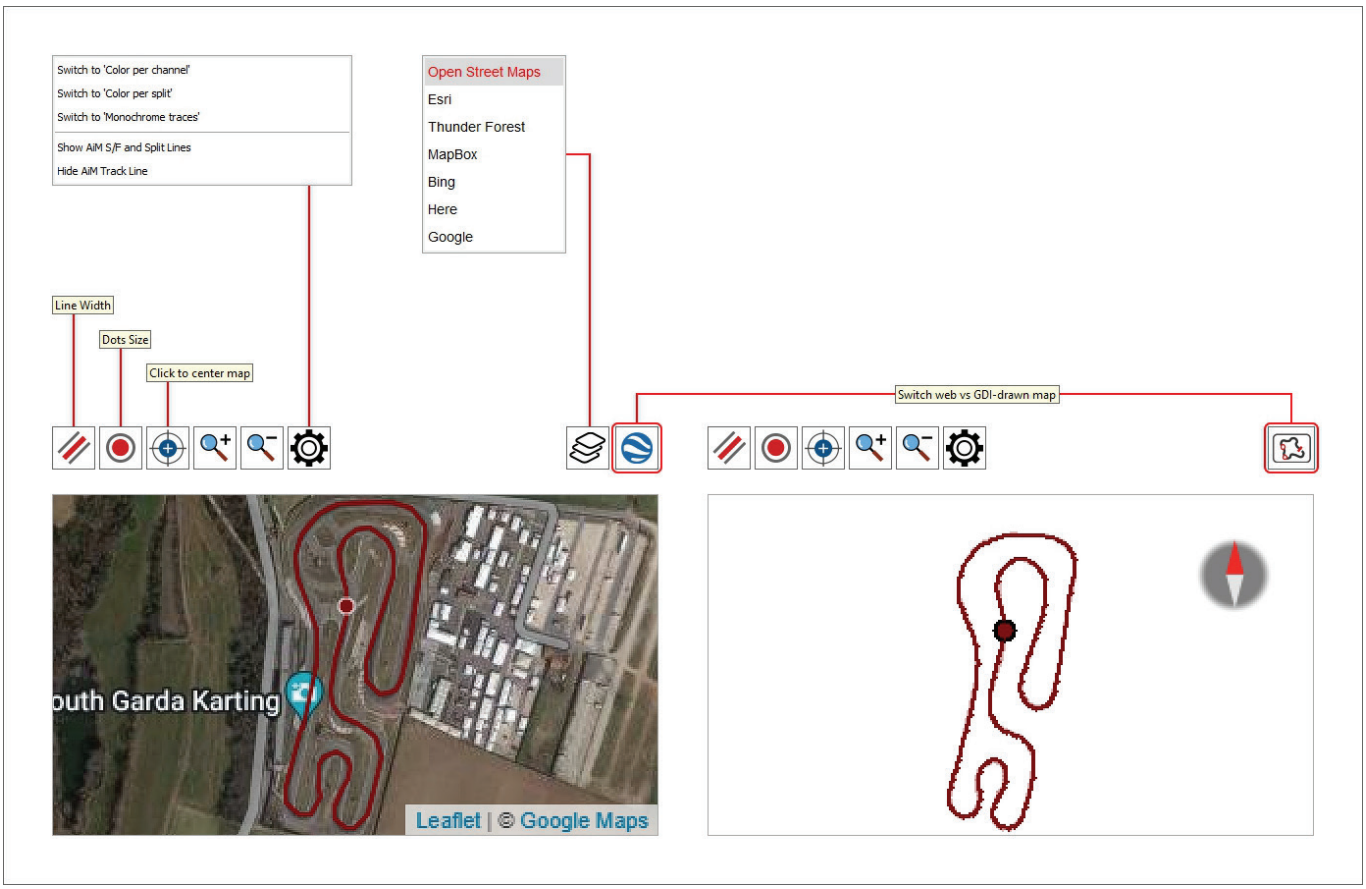


4.3 – The track view

Immediately below the channels table is the track Map view. You can:

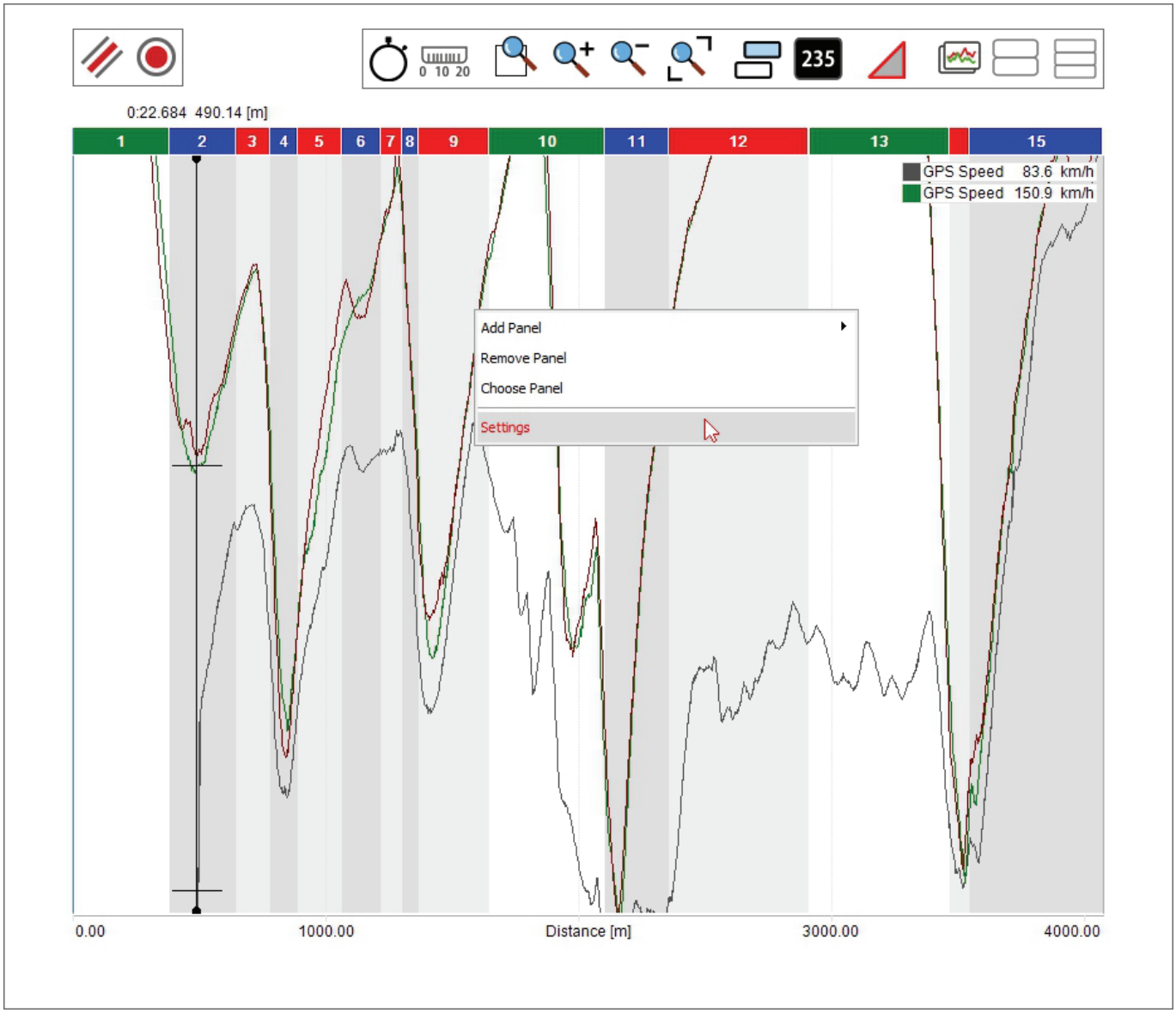
- decide line width and dots size (default value for both is 2)
- zoom in/out the map as well as centre it and
- through the setting icon
    - switch to different available track view: “Color per channel”, “Color per split” or “Monochrome traces”
    - Show AiM S/F (start/finish) and Split lines
    - Hide AiM track line
- choose the desired tile provider using the tile icon.

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

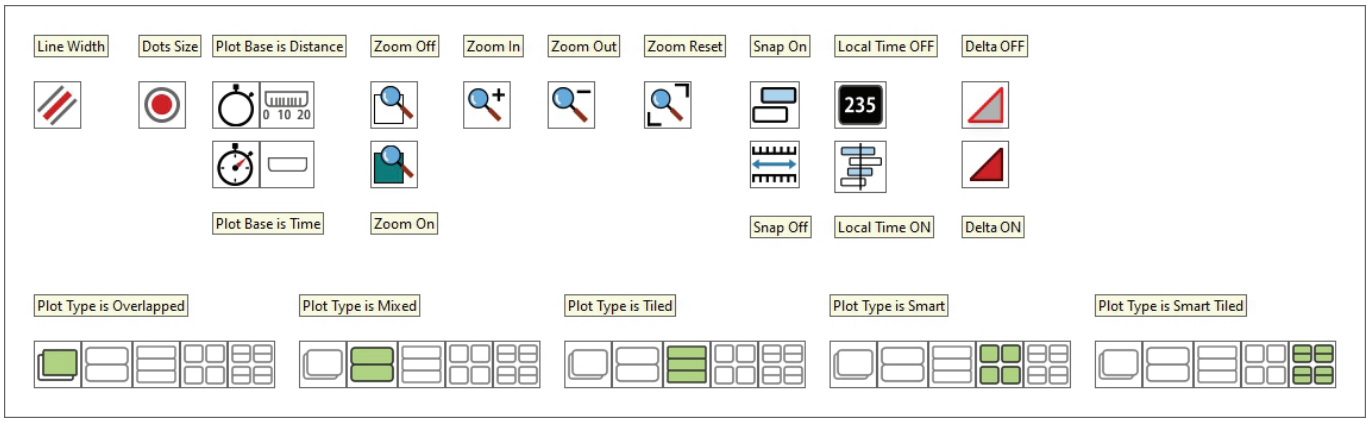


4.4 – Time/distance view: settings and keyboard working modes

Central in the page of the software is a graph whose appearance changes according to the icon you select in the keyboard above it as well as to the setting fixed in “setting panel”.



The image here below shows the keyboard above the graph; buttons placed one above the other are switching buttons. Different icons working mode are explained in paragraph 4.5.



Here follows a short explanation of the different options activated by the buttons.
Line Width: available line widths are: 1 (default), 2, 3, 5, 7, 9
Dots Size: available dot sizes are: 1 (default), 2, 3, 5, 7, 9

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

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

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

Local Time On/Off (useful to show different pilots in the same race):
- ON: shows "Time" on the abscissa axis, the selected time period in the storyboard and can be modified using the mouse wheel
- OFF: shows distance on the abscissa axis, the selected time period in the storyboard and can be modified using the mouse wheel

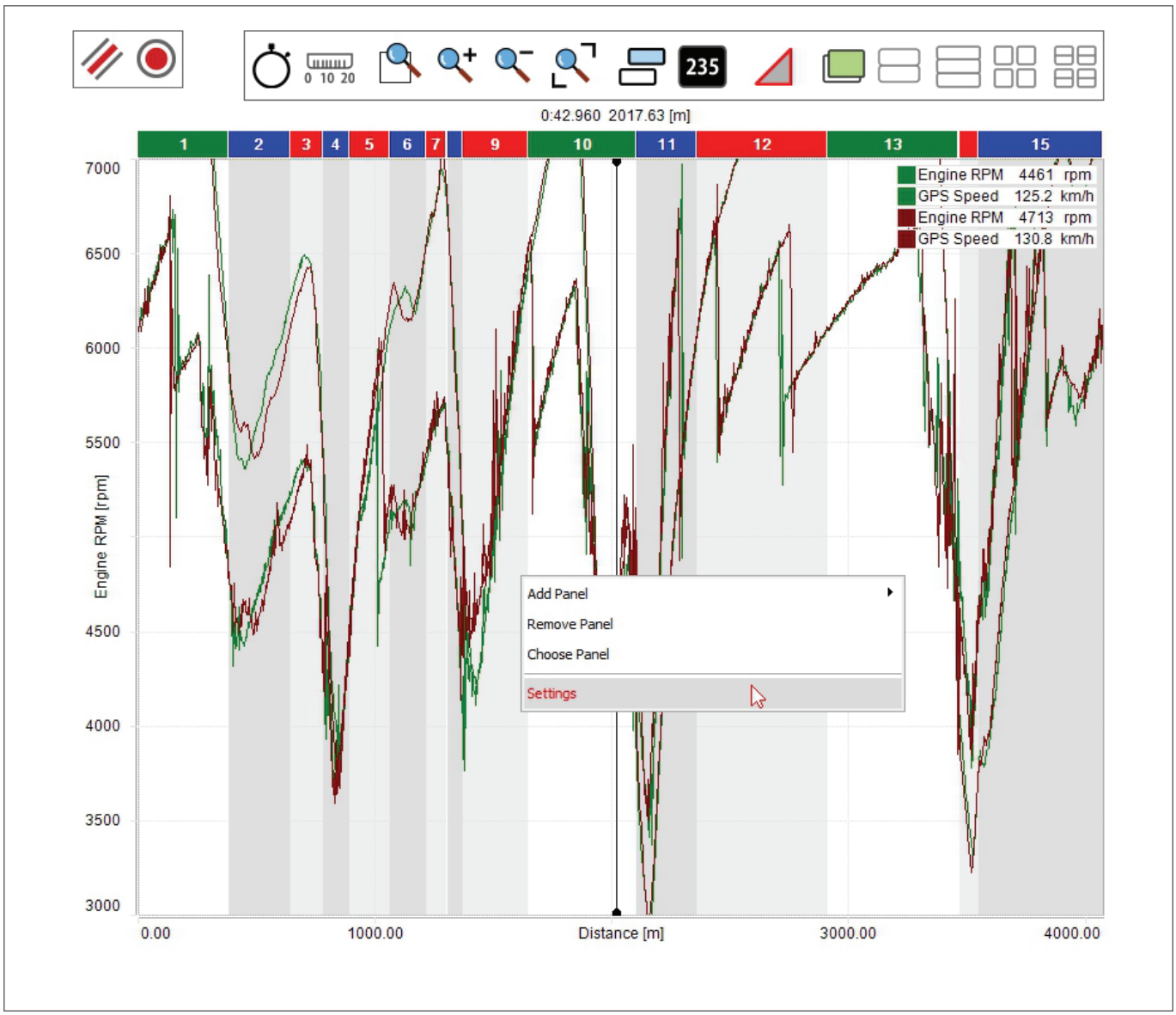
Delta ON: dragging and dropping the graph cursor the calculated time period/run distance is shown top left of the graph

Plot type can be:
- **Overlapped**: all shown channels are shown in the same graph
- **Mixed**: 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**: each channel has its own graph
- **Smart**: this plotting fits particularly channels bound to vehicle corners like dumpers, brakes, wheel speed and so on; each channel is in a separate graph. First of all you need to ensure that the channels are configured as bound to the vehicle corner
- **Smart Tiled**: analysing two groups of channels bound to vehicle corners it is possible to show them in the graph not only smart but also tiled.

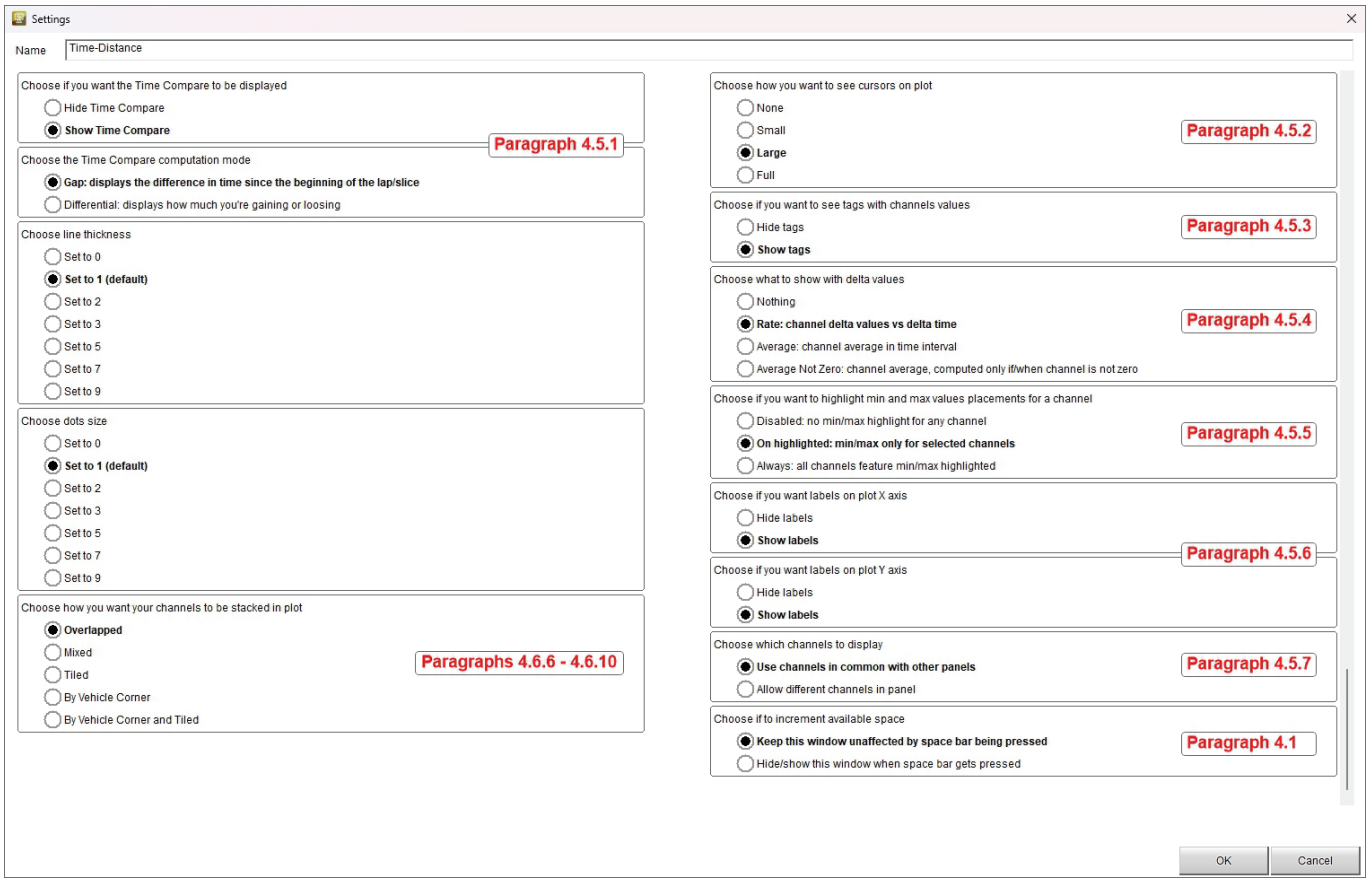
4.5 – Graph settings

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”

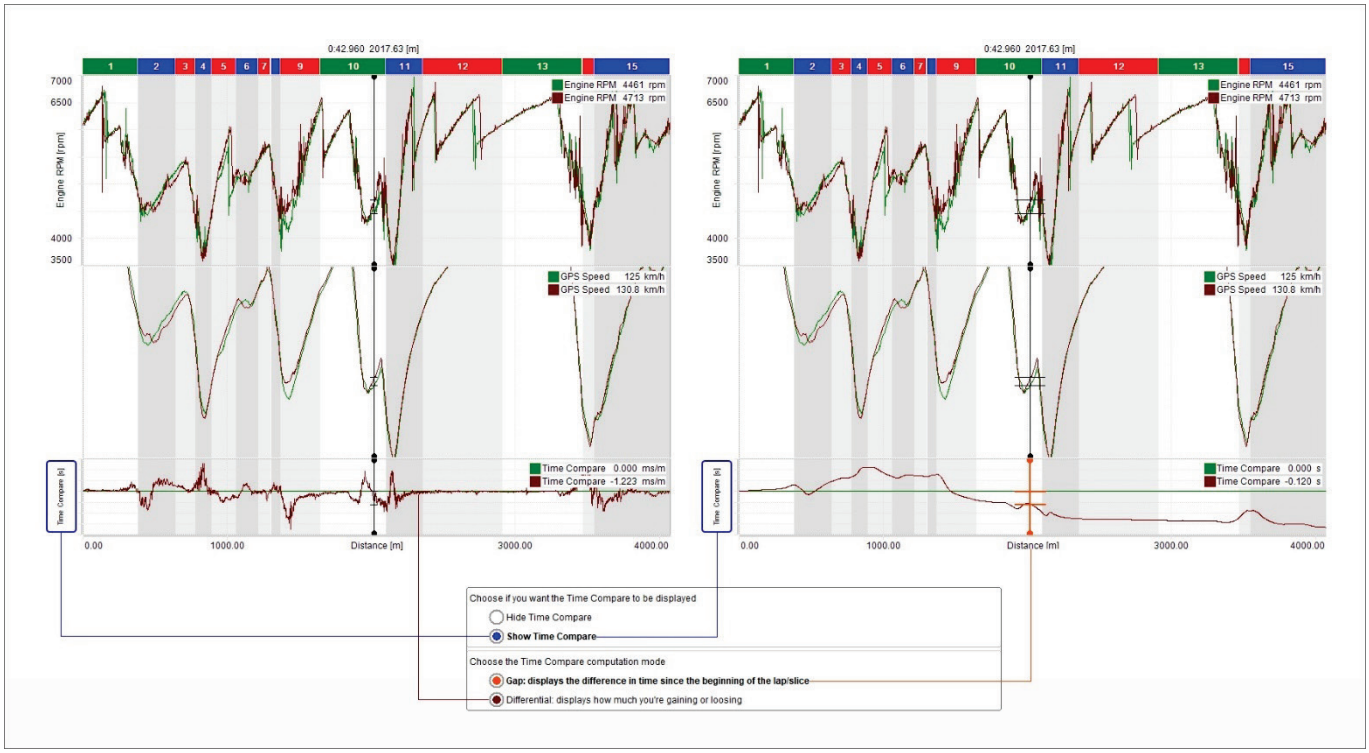


As for all graphs you can decide line width and dots size. The other features are explained in the paragraph here below indicated



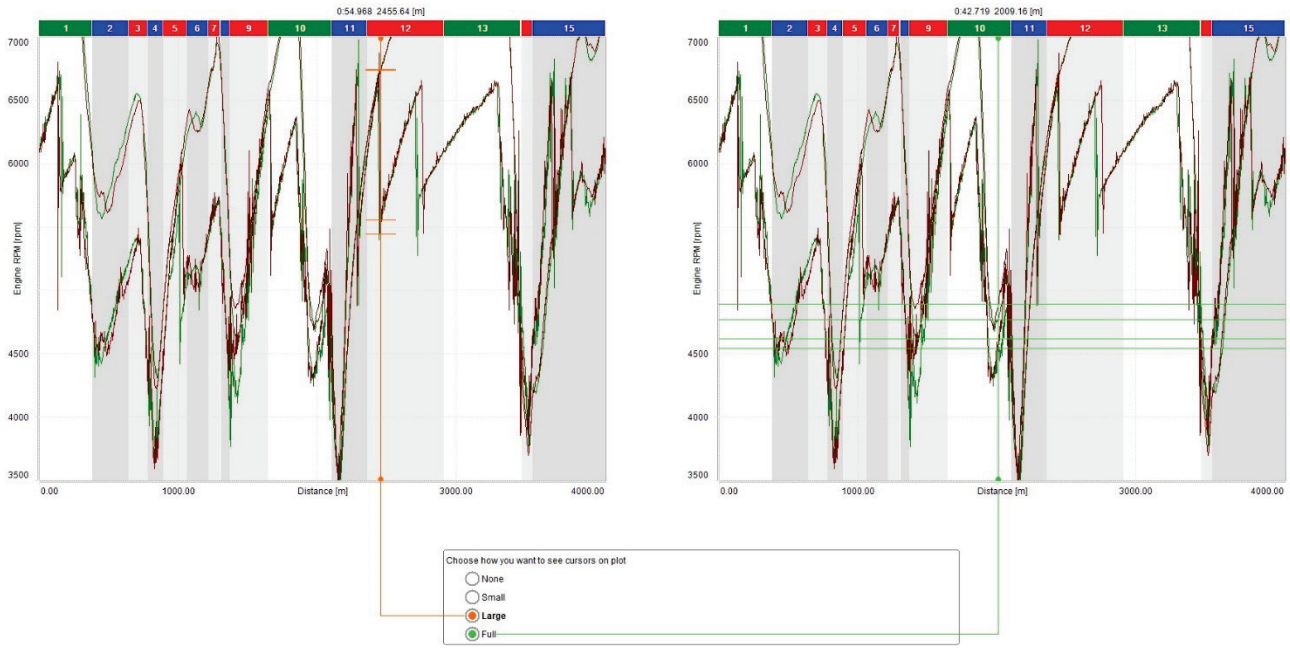
4.5.1 – Time compare setting

As shown here below Time compare can be hidden or shown and shown as “Differential” or as “Gap”.



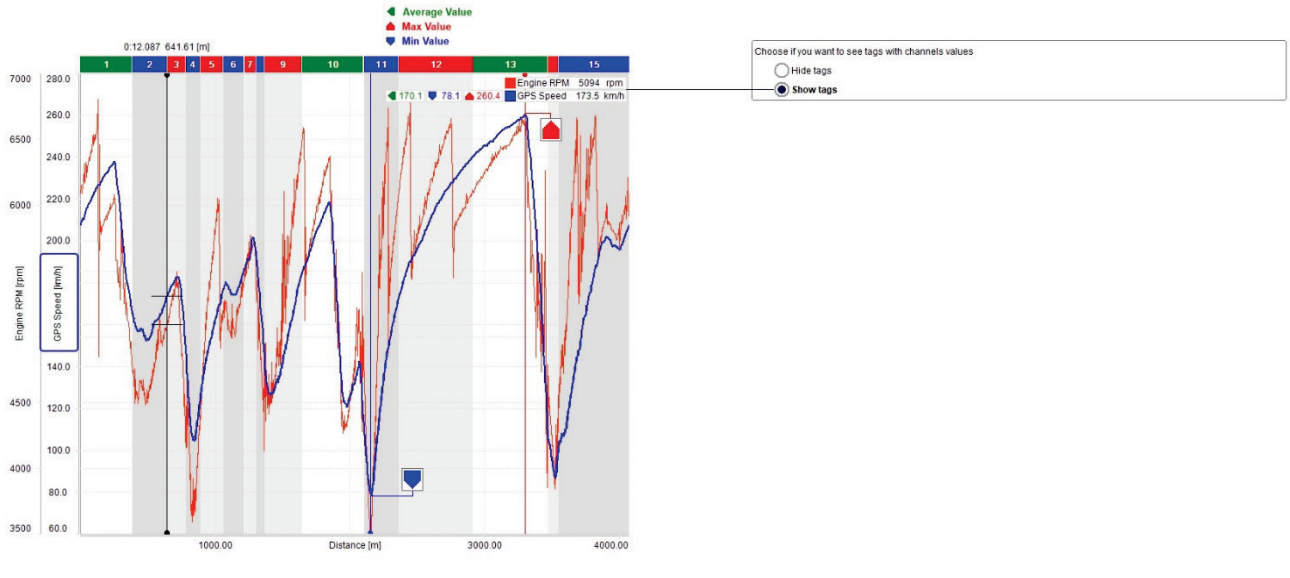
4.5.2 – Cursor settings

As shown here below the cursor can be hidden (none) or shown as small or as large and be “full” to say crossing the graph.



4.5.3 – Tags settings

As shown here 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 and max, min and average values of the channels are shown.



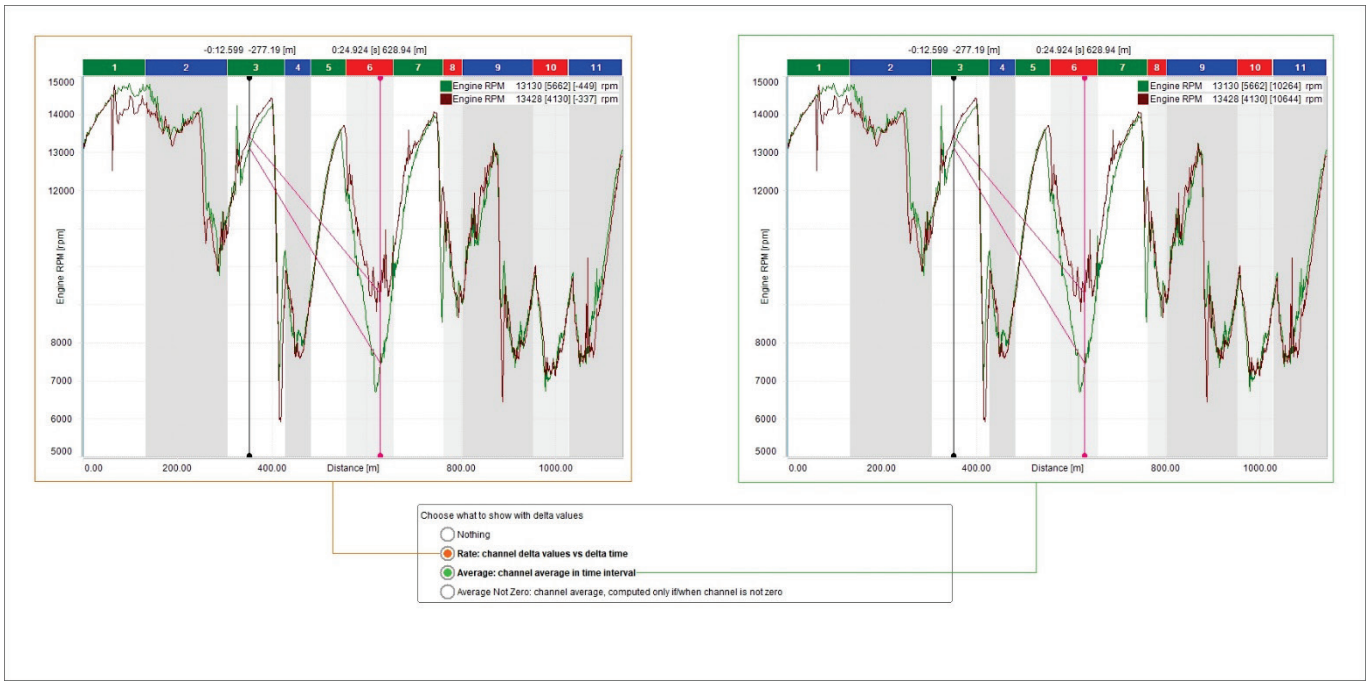
4.5.4 – Setting graphs in delta mode and managing it

Enabling "Delta" mode you can analyse the delta of a channel in two points. Available options are:

- Nothing
- Rate: channel delta values vs delta time
- Average: channel average in time interval
- Average not zero: channel average, computed only if/when channel is not zero

To show the delta:

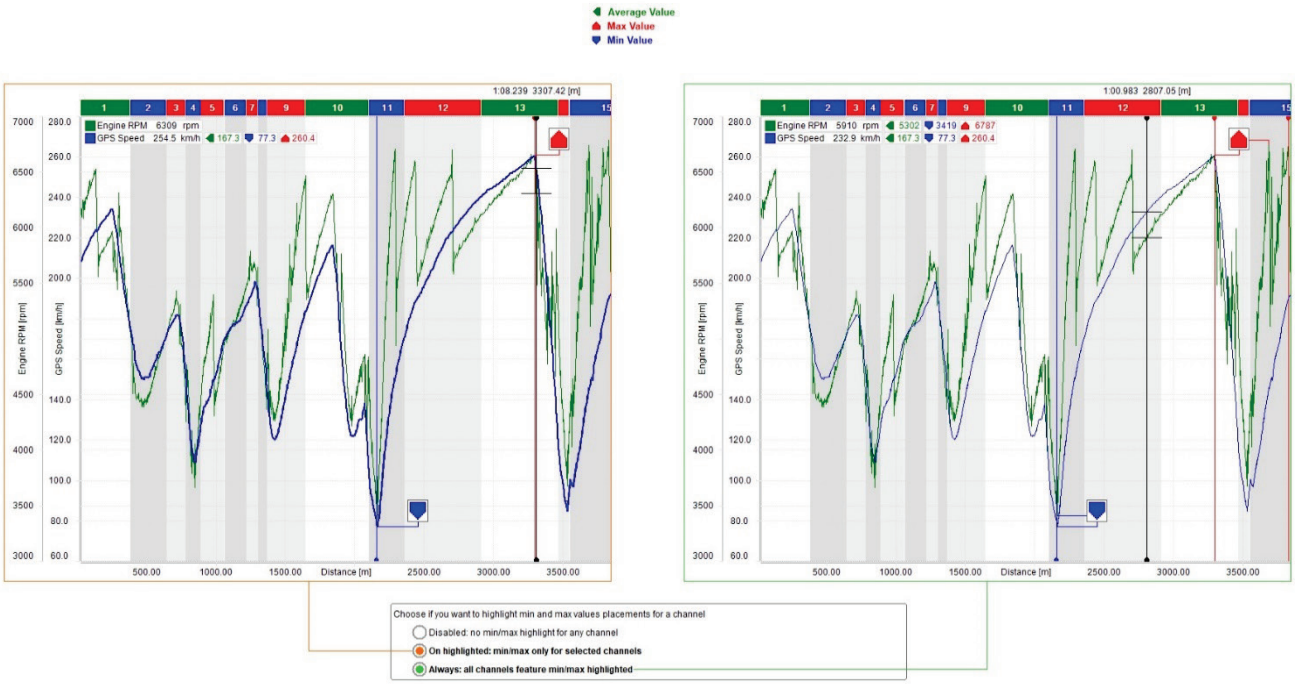
- click "Delta" icon: shown here above
- hook the graph cursor and drag it as you wish
- release the cursor: the delta is shown.



4.5.5 – Highlighting Max/Min values placements for a channel

It is possible to show max min values of the shown channels on the graph. Available options are:

- Disabled (no max/min values are highlighted on the graph)
- On highlighted: clicking on the tags (paragraph 4.3.4) the channel graph become thicker and max/min and average values are shown (left image below)
- Always: max/min and average values of all channels shown in the graph are shown (right image below)

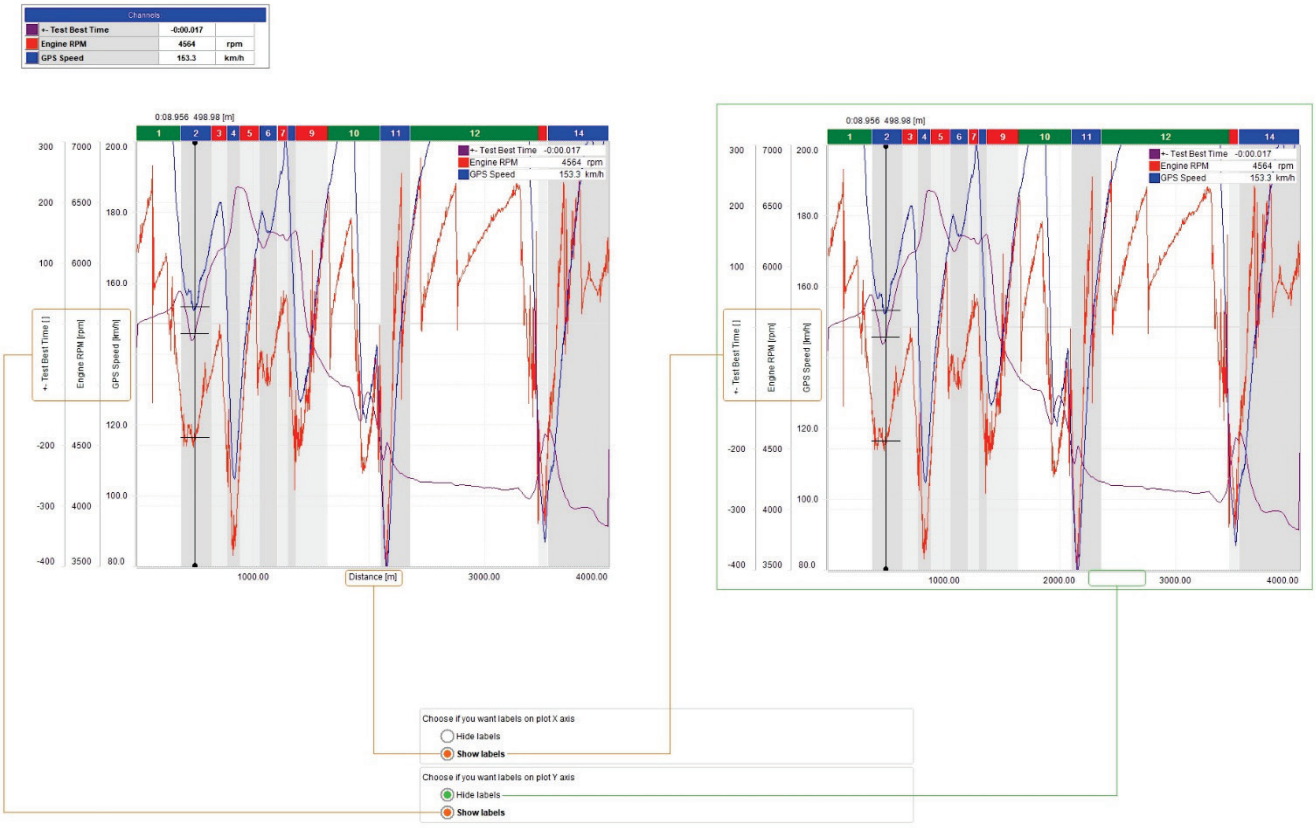


Min/Max values tags are three boxes that shows min/max and average value of the channel; the point where the min/max value has been sampled can be indicated; available options are:

- always: they are always shown
- on highlighted: they appear only selecting the channel tag
- disabled: they are never shown

4.5.6 – Managing labels on plot “X” and “Y” axis

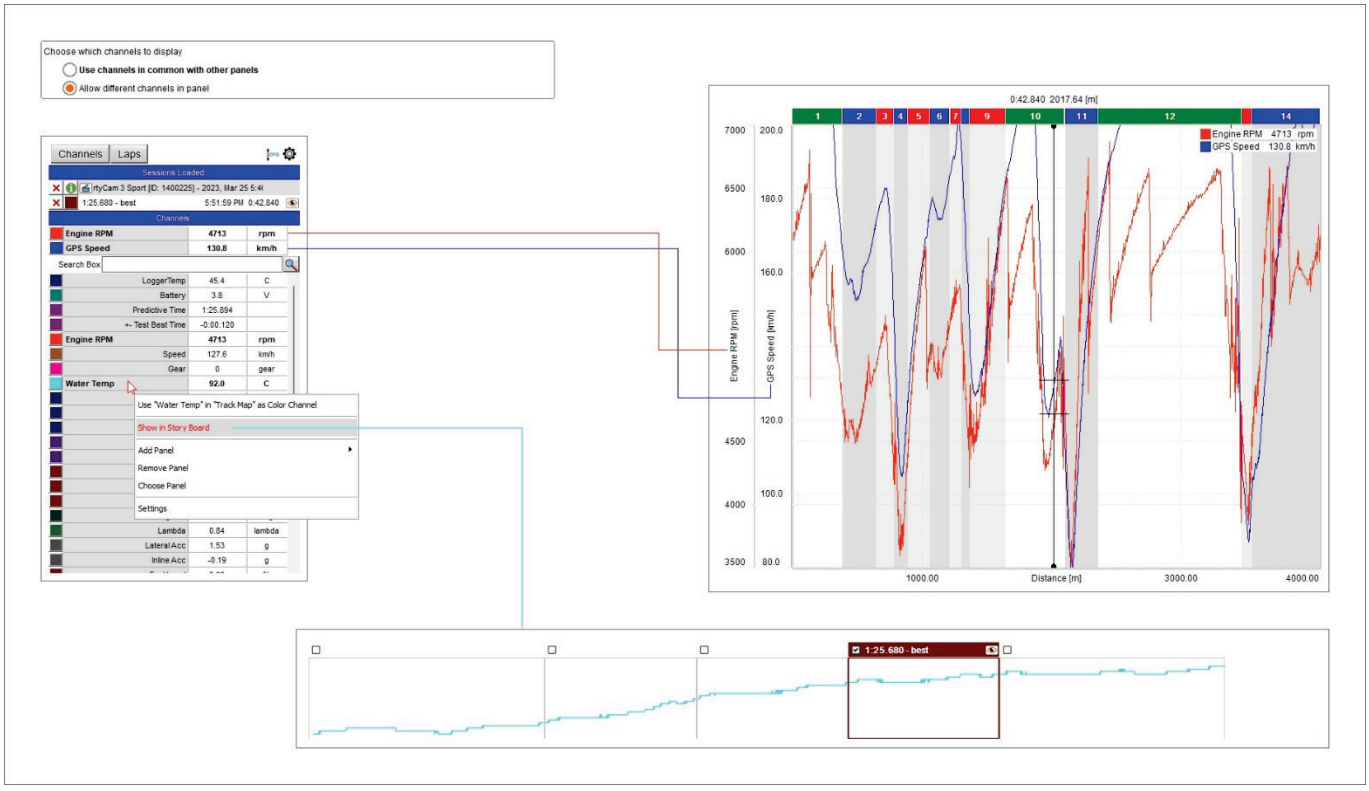
The central graph can show or hide labels on the axes. You can also decide to show them on one axis only as shown here below.



4.5.7 – Choose which channels to display

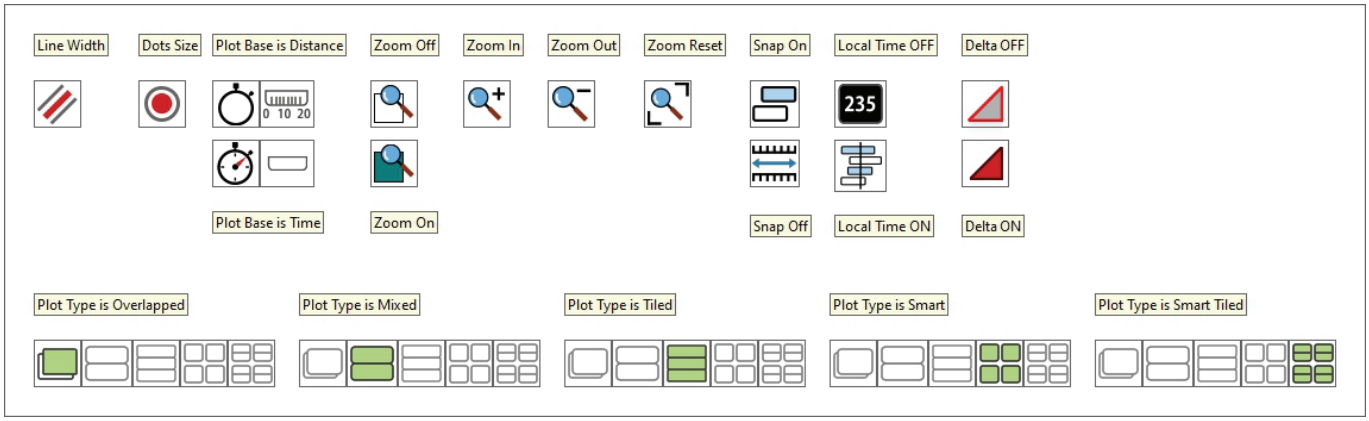
The channels shown in the central graph and in the storyboard can be changed enabling the related checkbox in "Setting" dialog window. To show, for example, Engine RPM and GPS speed in the central graph and water temperature in the storyboard follow these instructions:

- 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"
- As shown here below central graph shows RPM and GPS Speed while the storyboard bottom shows Water temperature graph



4.6 – The time/distance keyboard working mode

As said before the central graph can be managed also using the keyboard placed above it and shown here below.

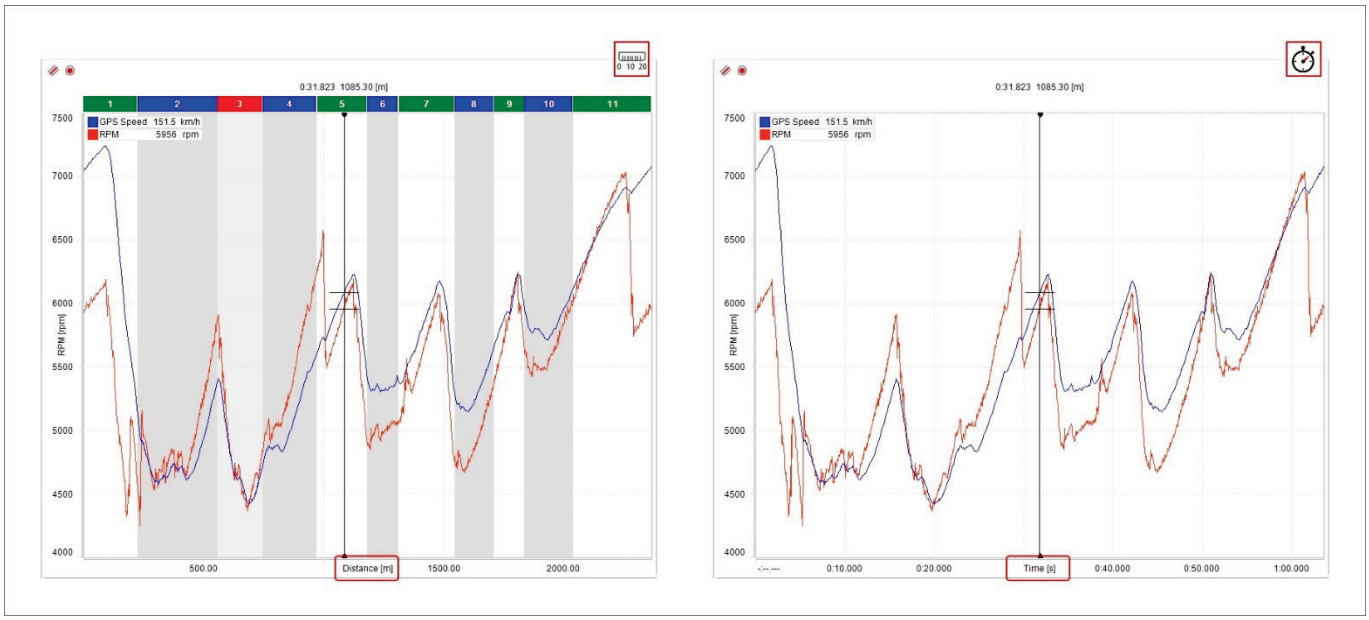


4.6.1 – Plotting the graph by Time/Distance

As shown here below, the main difference among the graphs is the channel plotted 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 shown on the graph and it 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. The graph can also be zoomed in/out with the mouse wheel (paragraph 4.6.2).

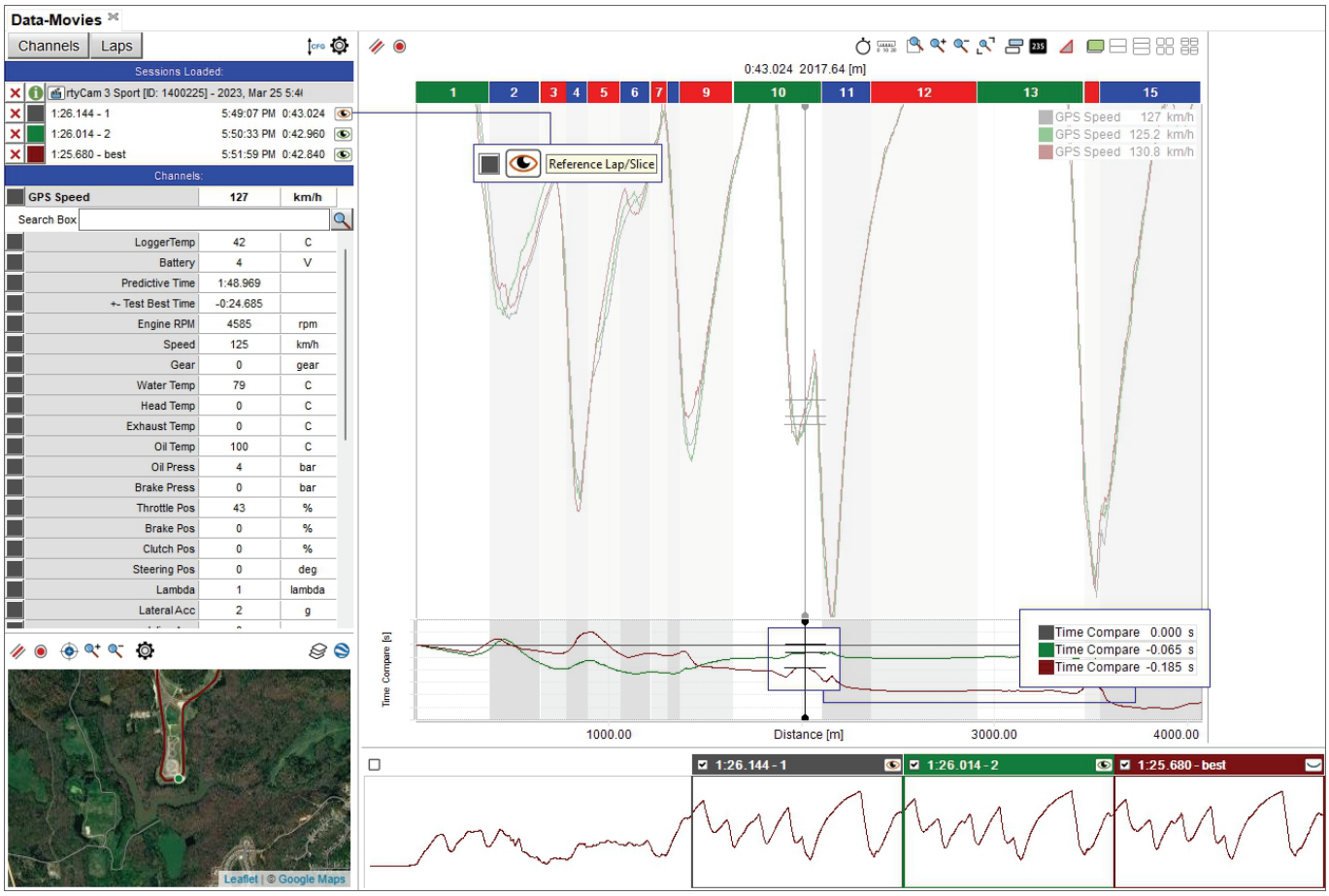


If more laps are open for analysis each one is indicated by an icon according to its status. In the image below the icons are shown centrally:

- 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 laps (reference slices) than these set in custom settings are open (paragraph 3.3)

"Time Compare" graph appears bottom of the graph view if enabled in the setting dialog window (see paragraph 4.5.1)

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



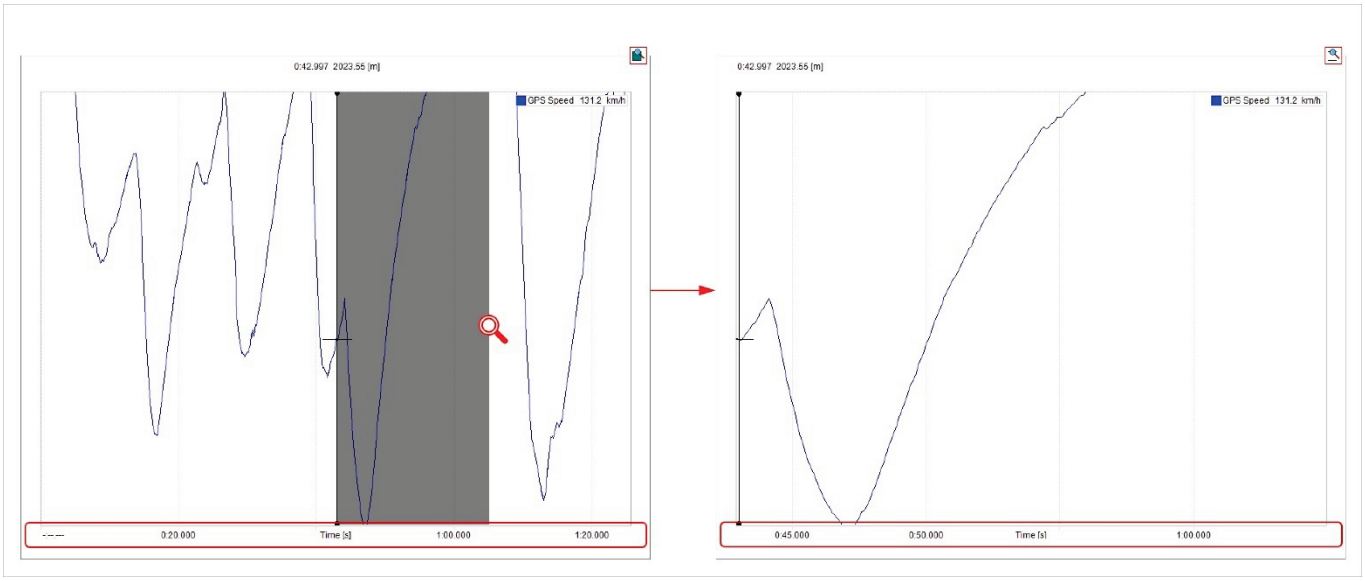
4.6.2 – Graph zooming

With the zoom buttons you can:

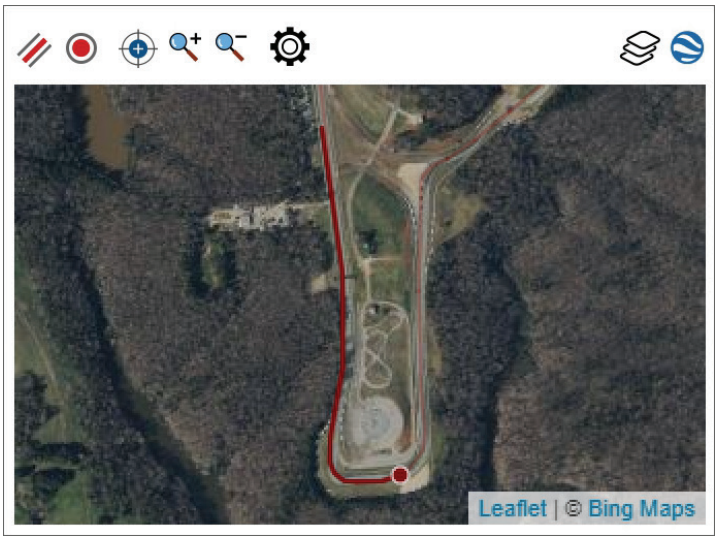
- Activate/deactivate the custom zoom
- zoom in/out and reset the graph zoom

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

- click on the first left 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)



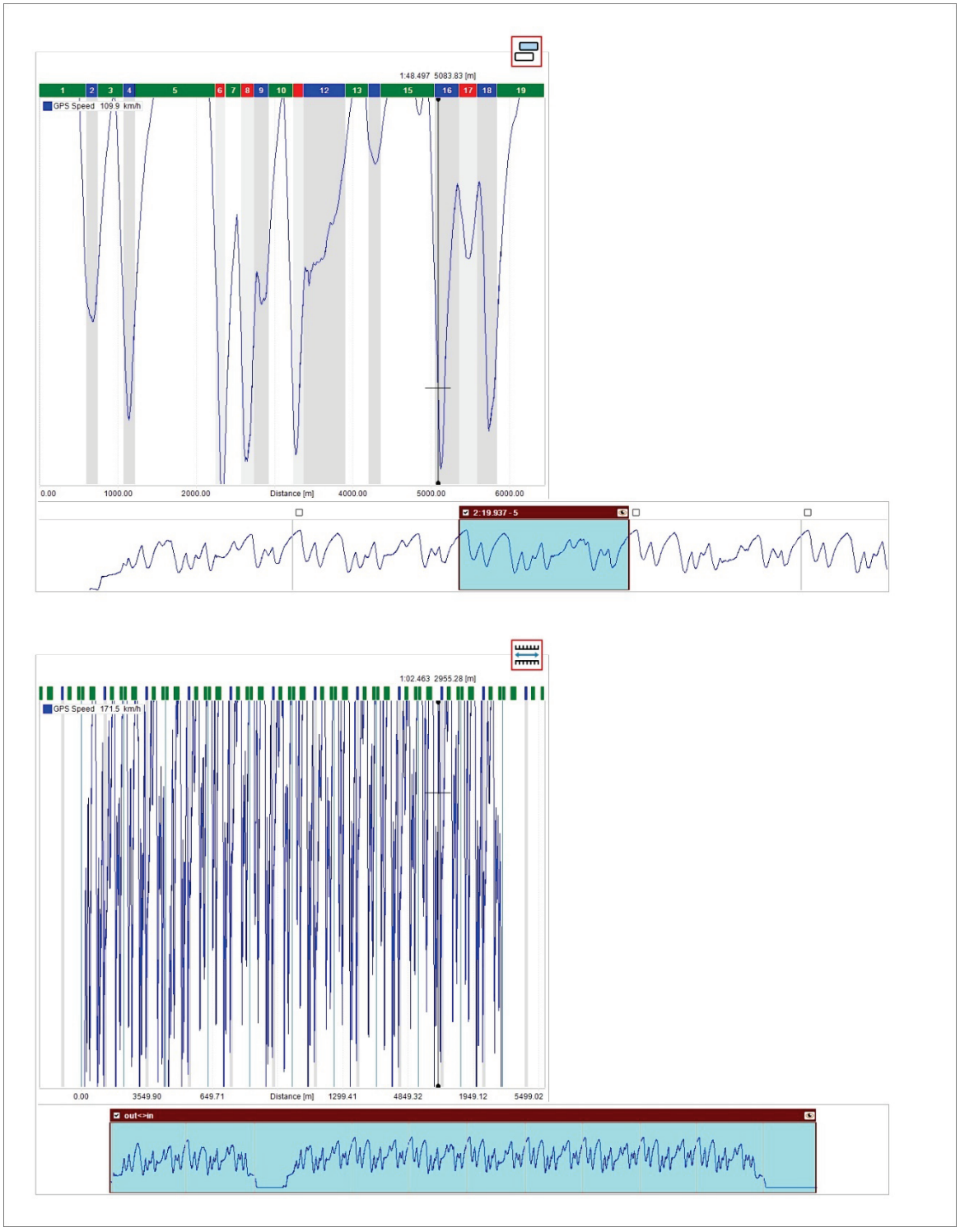
Once the graph is zoomed in the part of the track you have zoomed in is shown in the related box bottom left of the software page.



4.6.3 – Graph Snap ON/OFF mode

Assuming you are plotting the graph by distance, as shown here below:

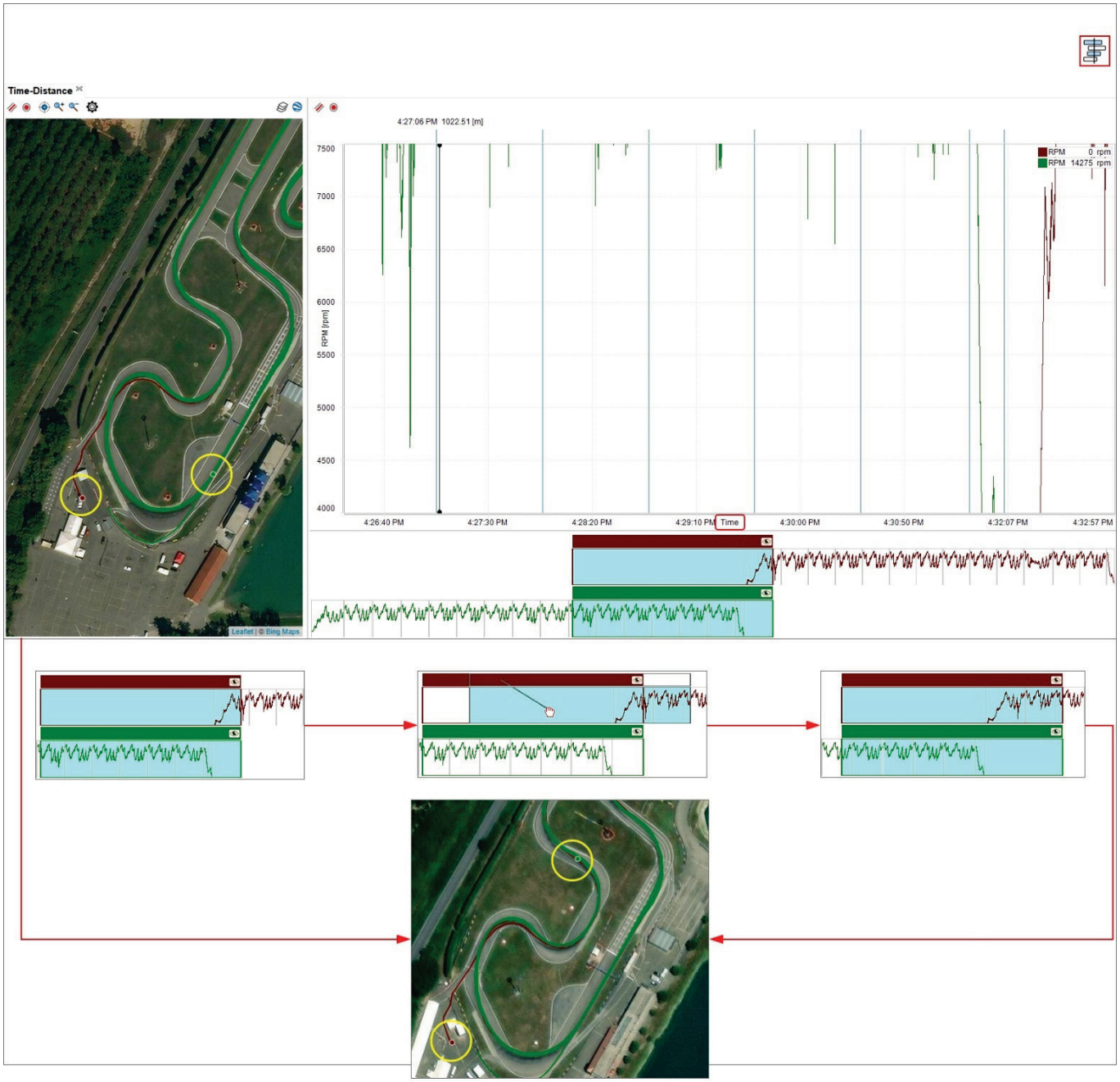
- with **Snap on** (top image) zooming out the graph it shows a lap in the central graph and in the storyboard
- with **snap OFF** (bottom image) zooming out the graph you see in the central graph and in the storyboard the entire session.



4.6.4 – Local Time ON/OFF (local time versus normal time)

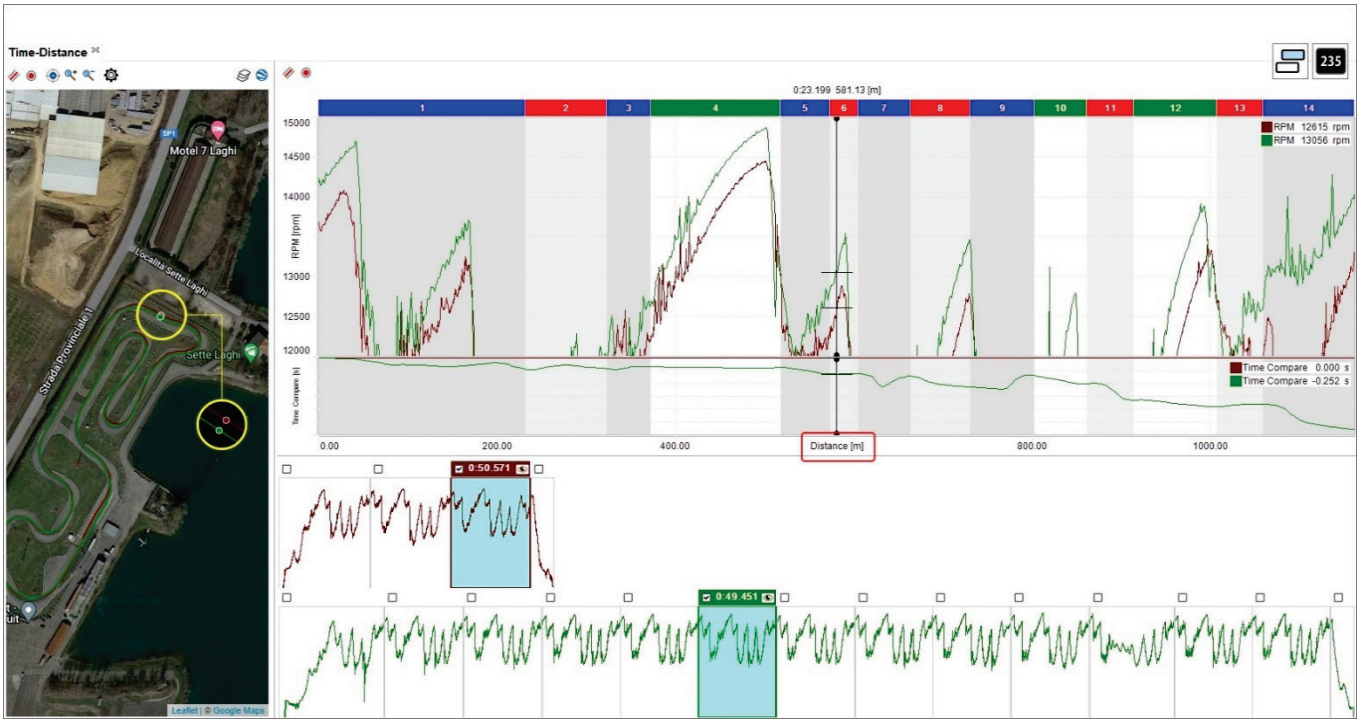
"**Local time on**" mode is very useful to compare different drivers on the same track:

- you can only have Time on the abscissa axis
- the track box shows the position of the drivers on the track
- 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 and
- dragging and dropping the selection in the storyboard you can see the same slice of a lap in the following lap and the related position of the drivers on the track too as shown bottom of the image below. The storyboard can always be dragged and dropped.

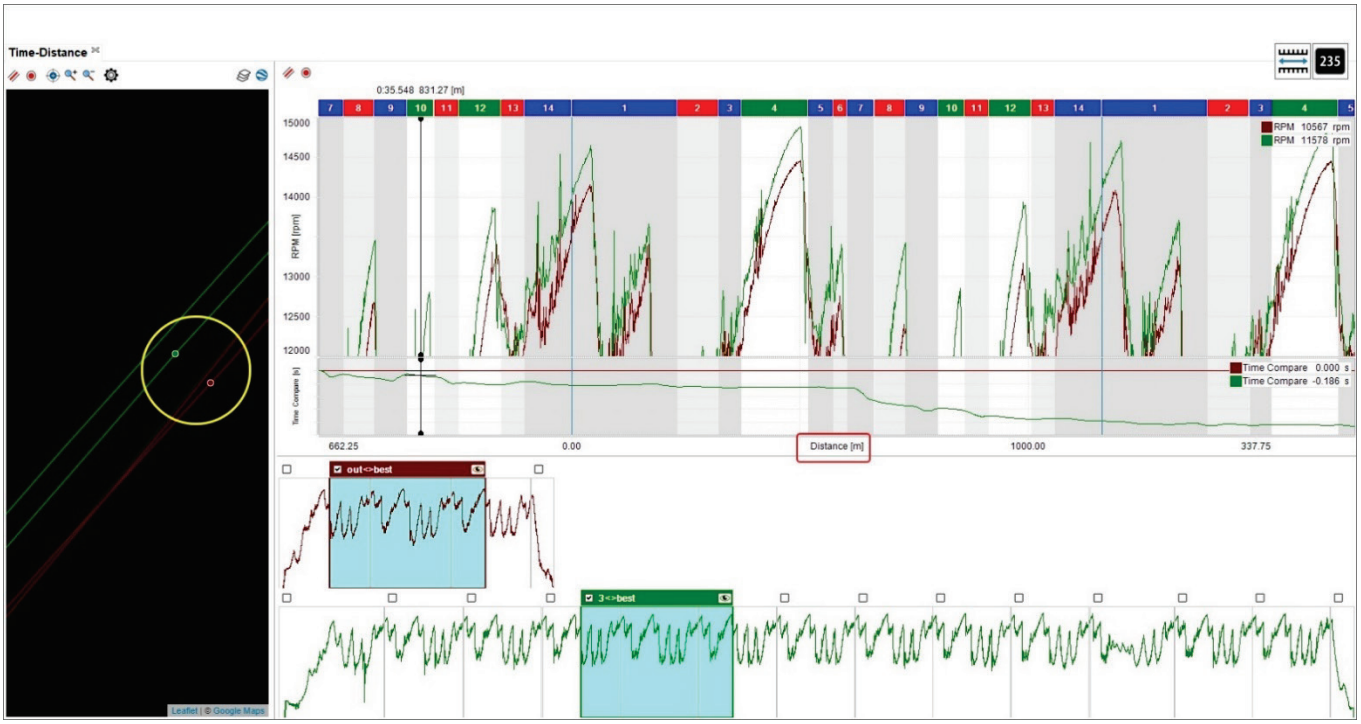


In "**Local timing off**" mode the abscissa axis can show "Time" or "distance", the graph can be in snap on/off mode and the storyboard selects a fixed range of time; the graph can be zoomed in/out with the mouse wheel. dragging and dropping the selection in the storyboard the slice of race shown in the graph is moved as explained before.

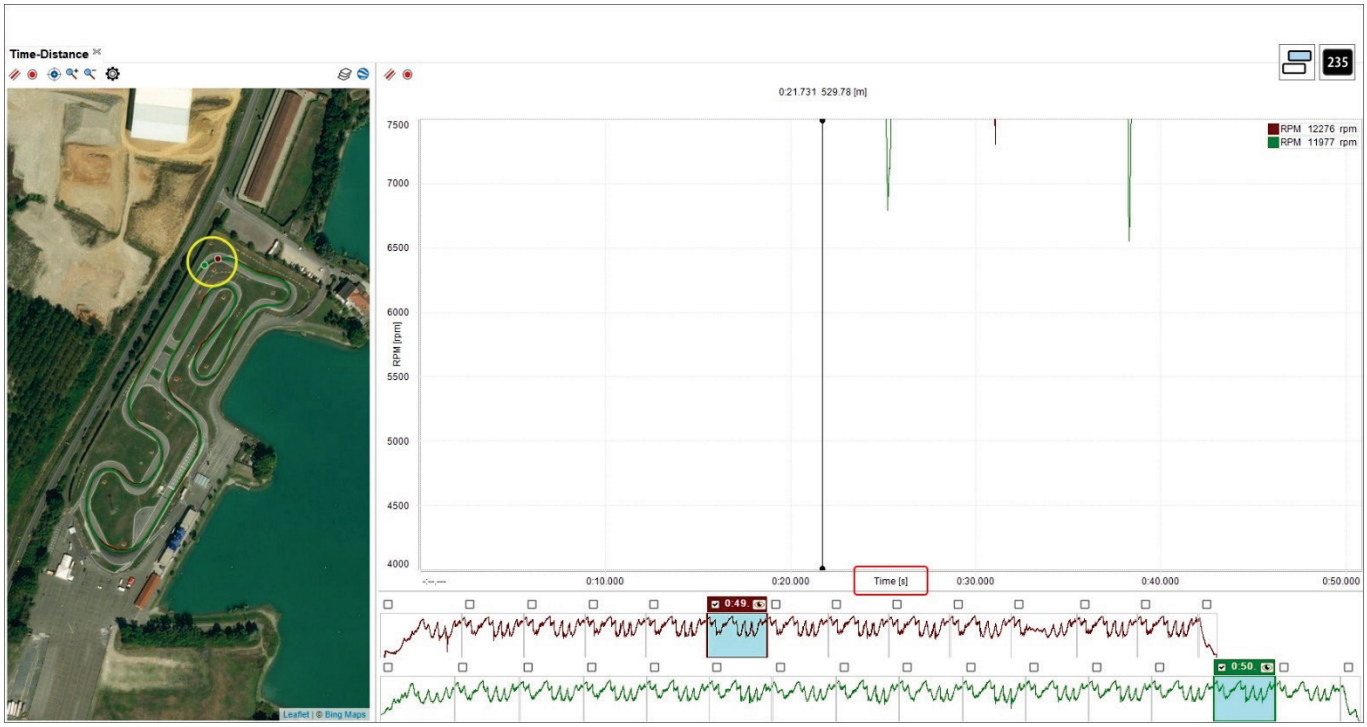
Local timing off and plot mode Snap on



Local timing off and plot mode Snap off



Local timing off and time on the abscissa axis



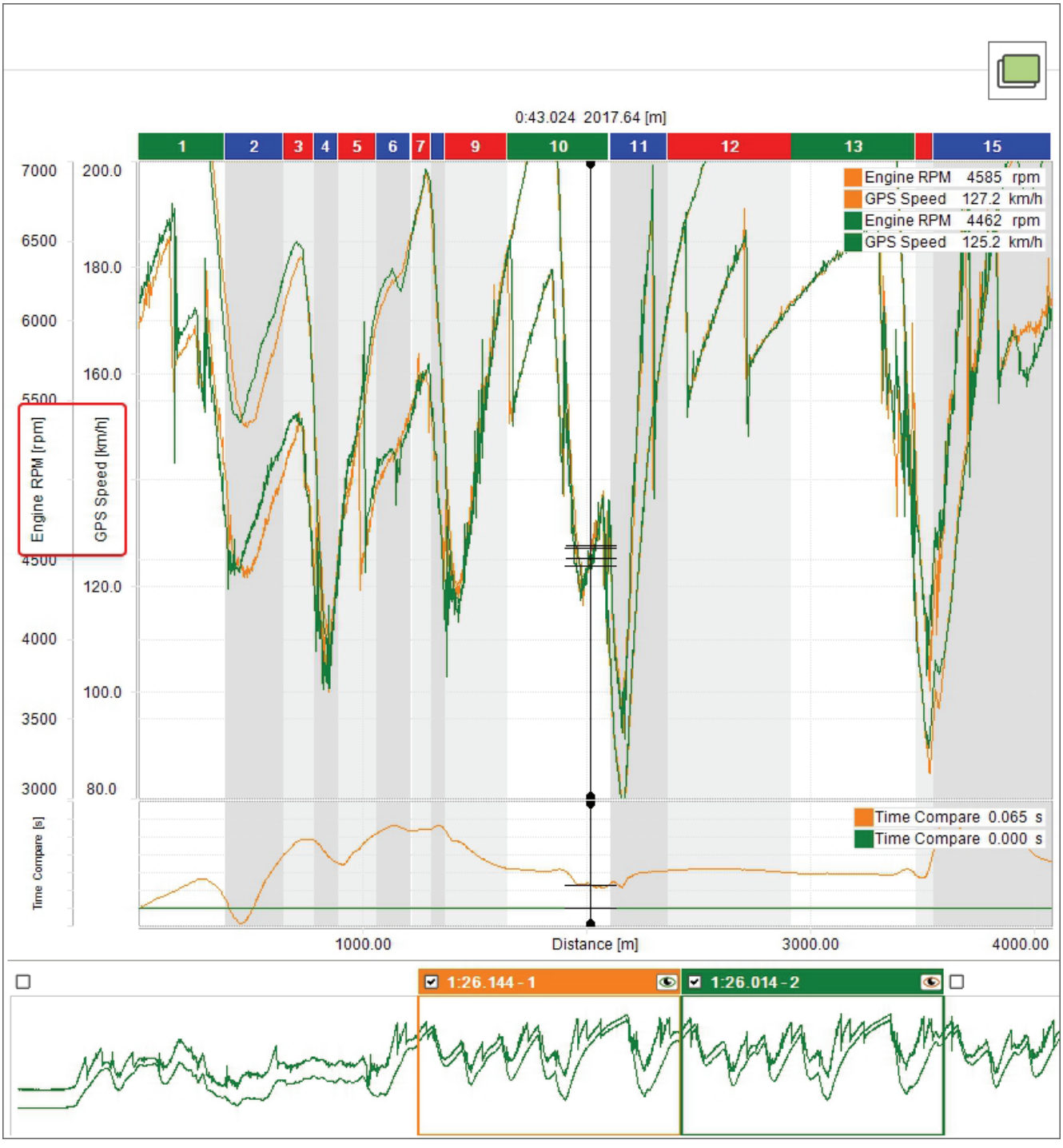
4.6.5 – Graph in delta Mode

See paragraph 4.5.4.

4.6.6 – Graphs plotting overlapped

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

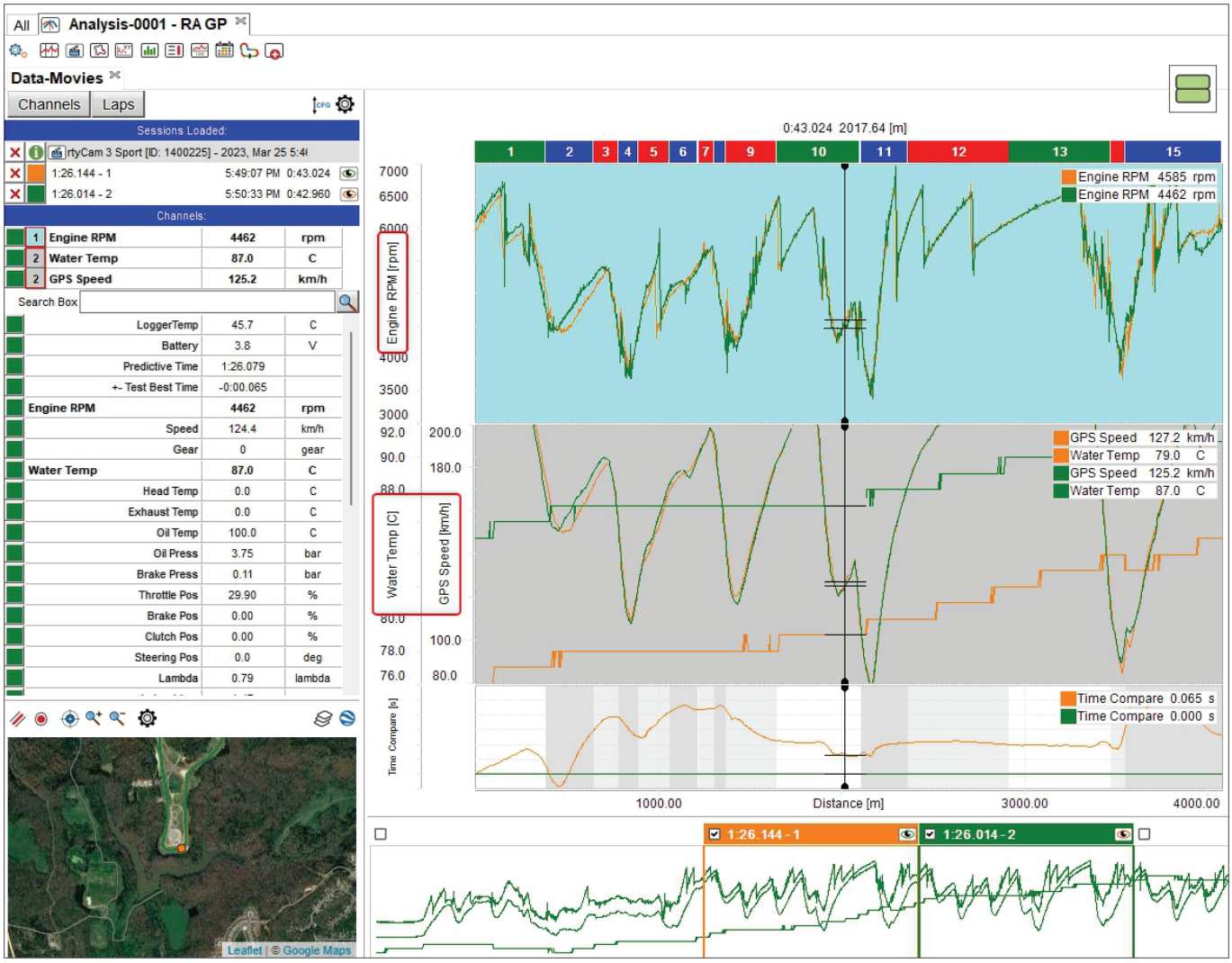
- a lap is plotted green and the other orange
- the channels you are analysing are both indicated on the ordinate axis
- the graph plot base is distance and "Time Compare" graph is enabled (paragraph 4.5.1) and shown bottom of the main graph.



4.6.7 – 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:

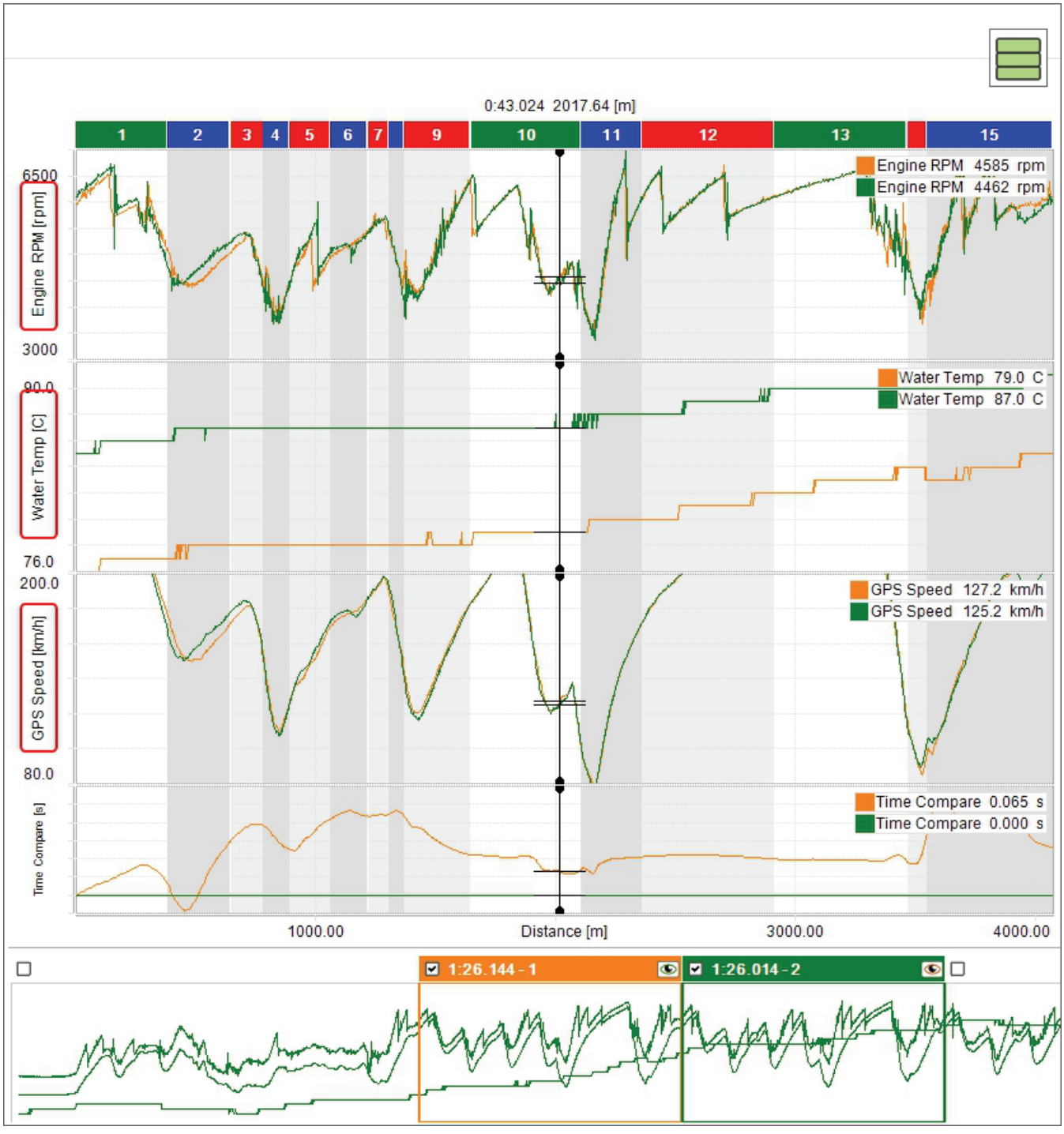
- a session is plotted green and the other orange
- Engine RPM channel is plotted in graph "1" (Top)
- Water Temperature and GPS Speed are plotted in graph "2" (central)
- You can change the graph where a channel is plotted clicking on the box left of the channel in channels table
- max allowed number of graphs is six
- the channels you are analysing are both indicated on the ordinate axis
- the graph plot base is distance and "Time Compare" graph is enabled (paragraph 4.5.1) and shown bottom of the other graphs.



4.6.8 – Graph plotting tiled

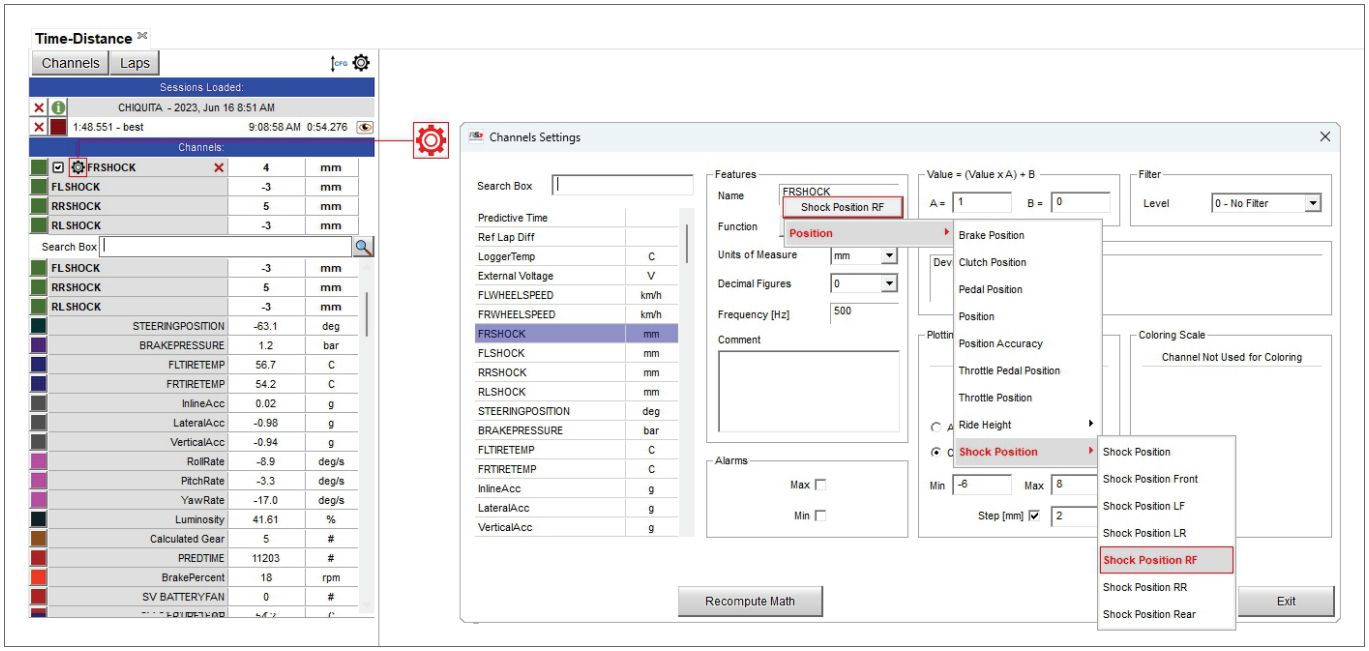
When the graph plotting is tiled each channel is plotted in a graph and the channels belonging to the same session are identified by the same colour. In the example below:

- a session is plotted green and the other orange
- plotted channels are Engine RPM, Water temperature and GPS Speed
- the channels are indicated on the ordinate axis

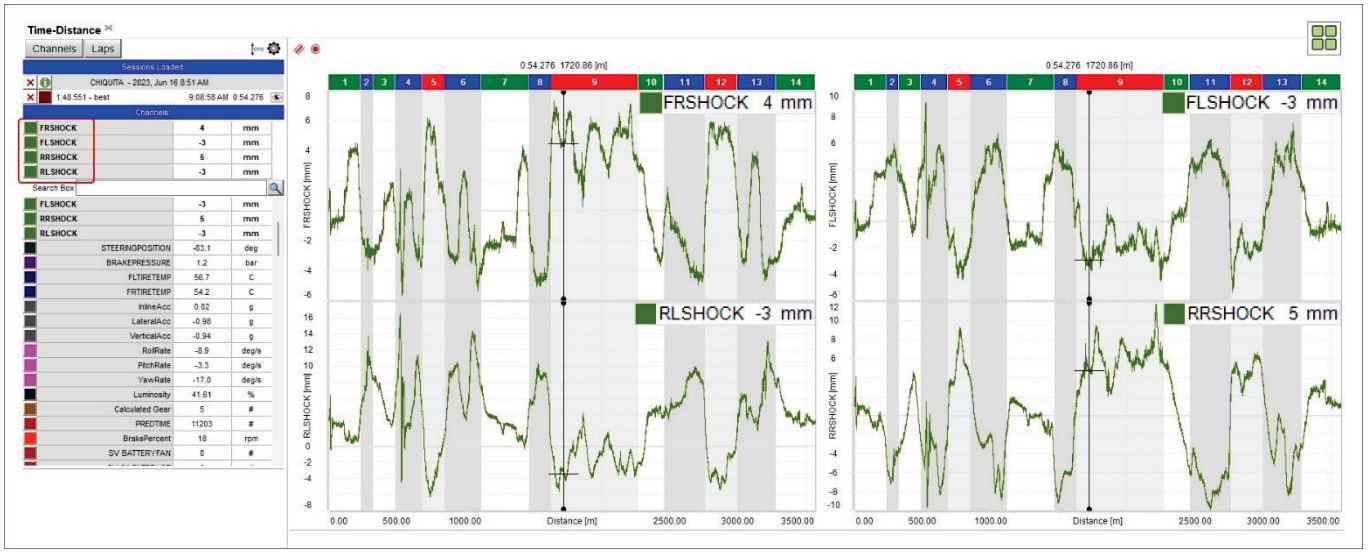


4.6.9 – Graph plotting smart

This plotting fits particularly channels bound to vehicle corners like dumpers, brakes, wheel speed and so on. First of all you need to ensure that the channels are configured as bound to the vehicle corner like shown here below.

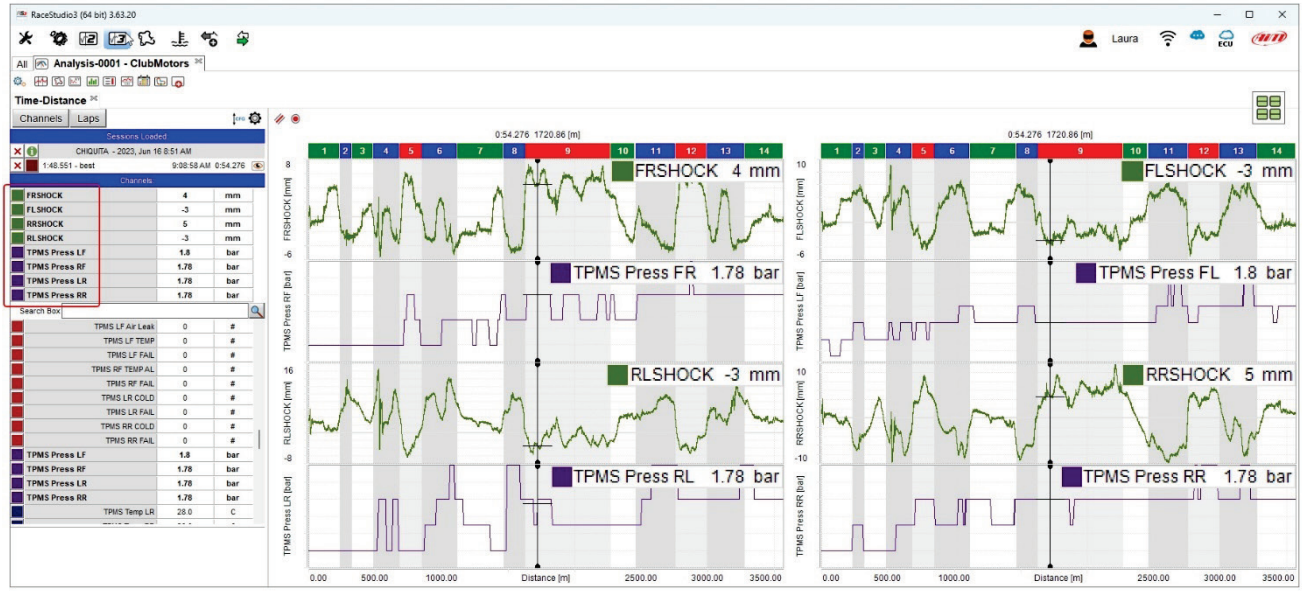


Once the procedure performed for all channels bound to vehicle corners you can show them smart, to say showing a graph for each channel as shown here below.



4.6.10 – Graph plotting smart tiled

If analysing two groups of channels bound to vehicle corners it is possible to show them in the graph not only smart but also tiled as shown here below.



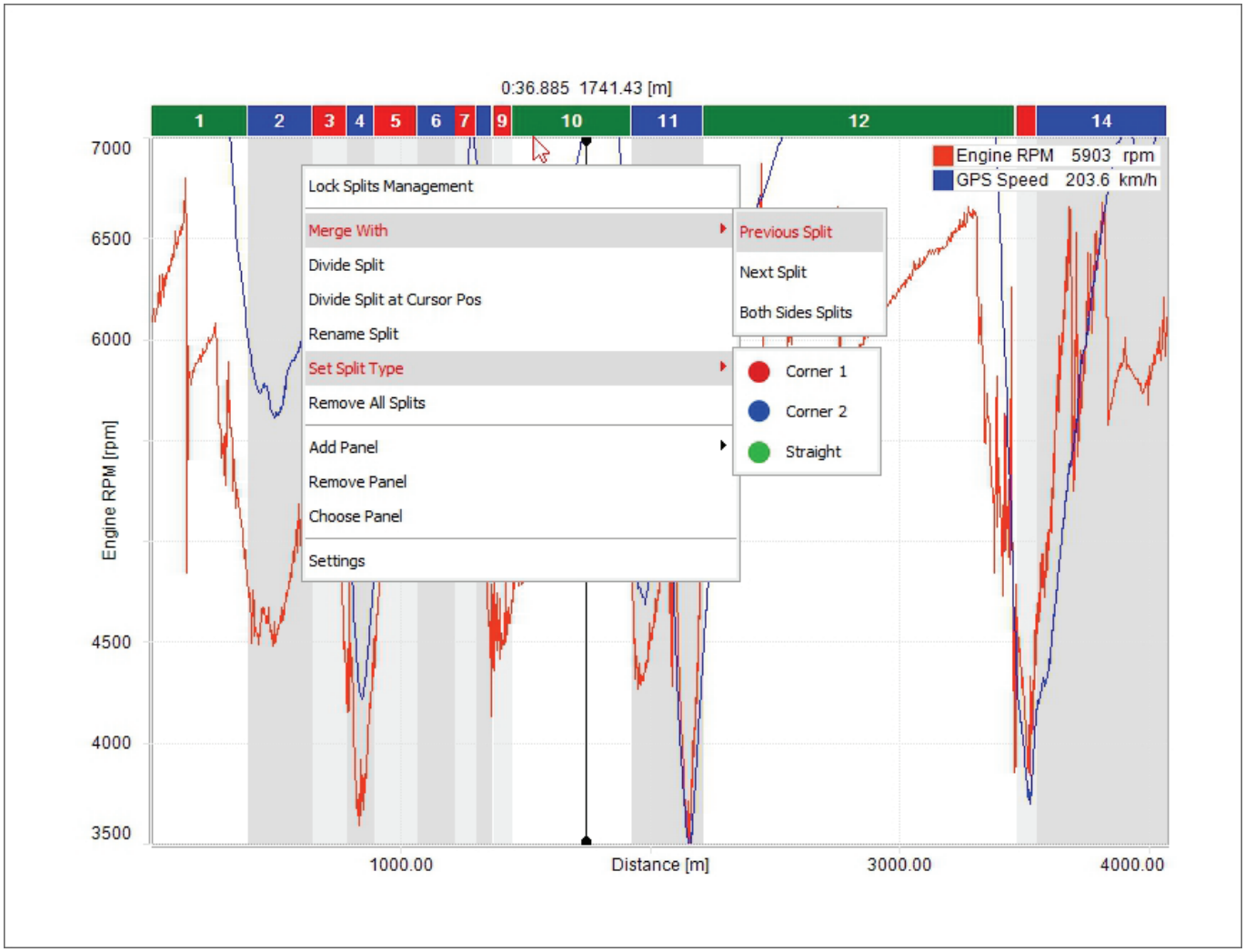
4.7 – Managing track splits

In time/distance view all splits are identified by a coloured bar top of the graph. By default splits are locked; right clicking on the bar you can unlock them; in a few seconds they will be re-locked.

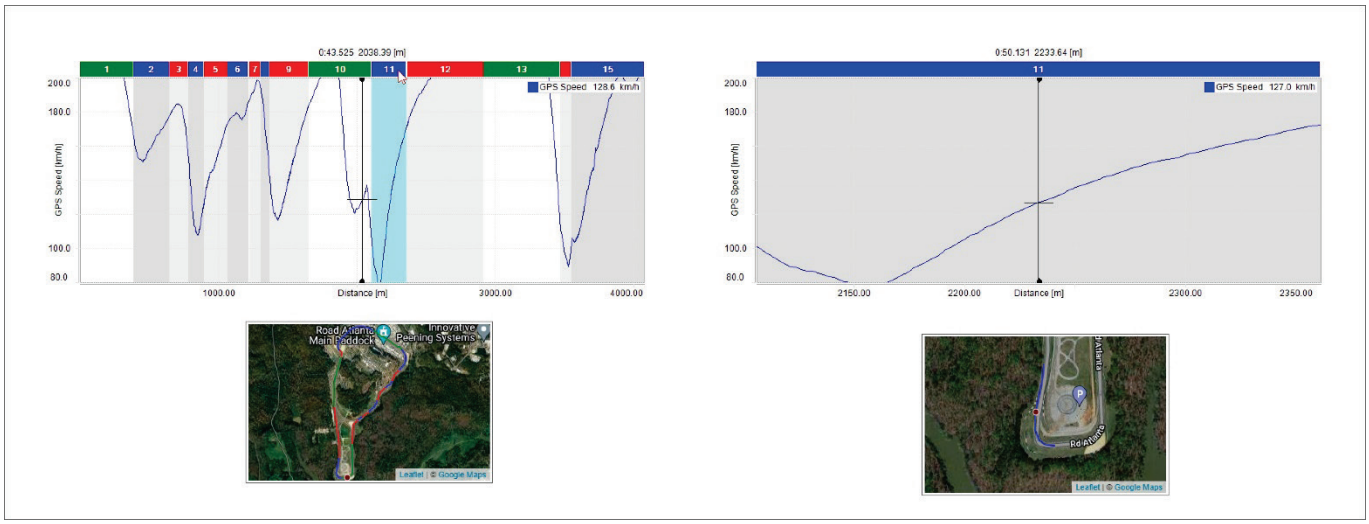
Please note that all changes made in this panel are saved and shown anywhere the track is recalled. To see the changes in the track map, bottom left of the view you need to set it as "Switch to colour per split" (see paragraph 4.3).

Right clicking on the split bar it is possible to:

- **Merge more splits**. Each split can be merged with previous split, with next split, with both sides split
- **Divide splits**
- **Rename Split**
- **Set split type as**: corner 1, corner 2, straight
- **Duplicate split sequence**
- **Add/Remove/Choose** a panel



Double clicking on a split of the split bar the graph resizes at that split level and so does the track map bottom left of the software view; clicking again on the split bar the graph and the track map are resized back.



4.8 – The movie(s) panel

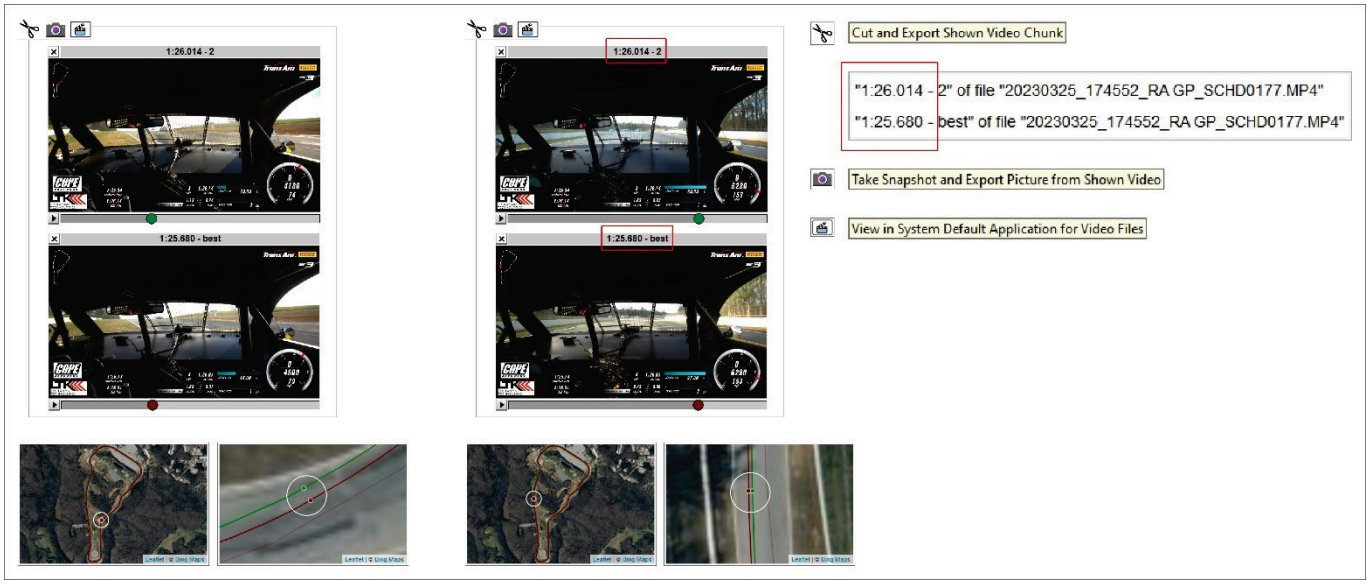
Right of the software view are the videos included in the sessions. Enabling the corresponding checkbox in “Settings” dialog window videos can be hidden/unhidden when the space bar get pressed (paragraph 4.1).
The session each video refers to is identified by the colour of play button in the video; it recalls the colour of the sessions in channels table top left of the software view. The position of the driver on the track is shown in the map and in the central graph.

Pressing “play” button on one video:

- all video starts
- the cursor in the central graph moves following the movie
- the track map shows the driver moving on the track

Through the keyboard top of the videos, it is possible to:

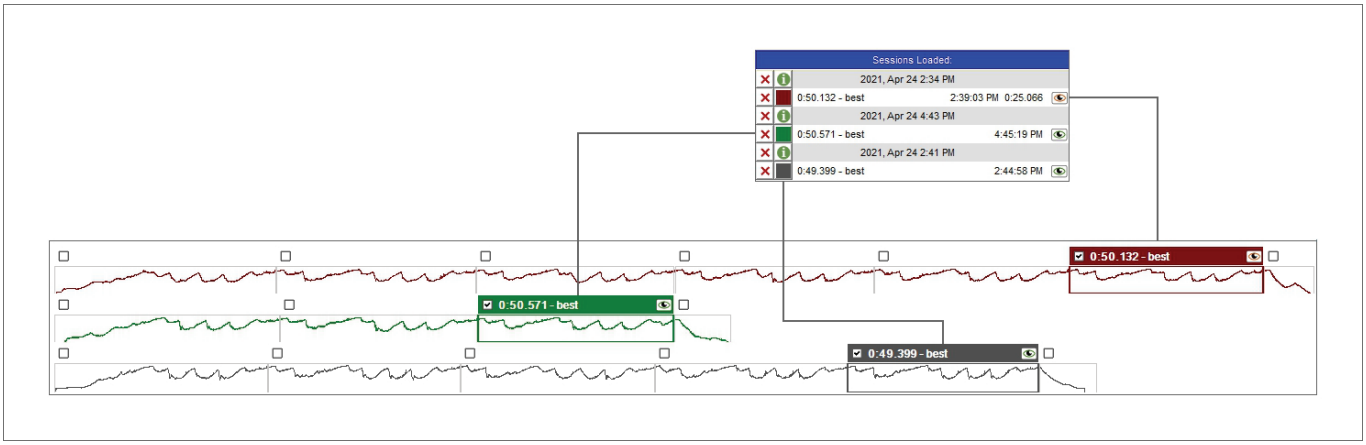
- cut and export the video chunk from the starting point to the current moment
- take a snapshot and export the picture of the current videos in a default folder (browse the PC to change the destination folder)
- view the video in the system default application for video files.



4.9 – The storyboard

Bottom of the software view is the storyboard. By default it shows the graphs of all laps with best lap of the session indicated and – if more sessions are open – it shows so many rows as many sessions are open. Selecting a lap its lap time appears on 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 (paragraph 4.5.7).
- hide/unhide the storyboard pressing and re-pressing the space bar (paragraph 4.1).

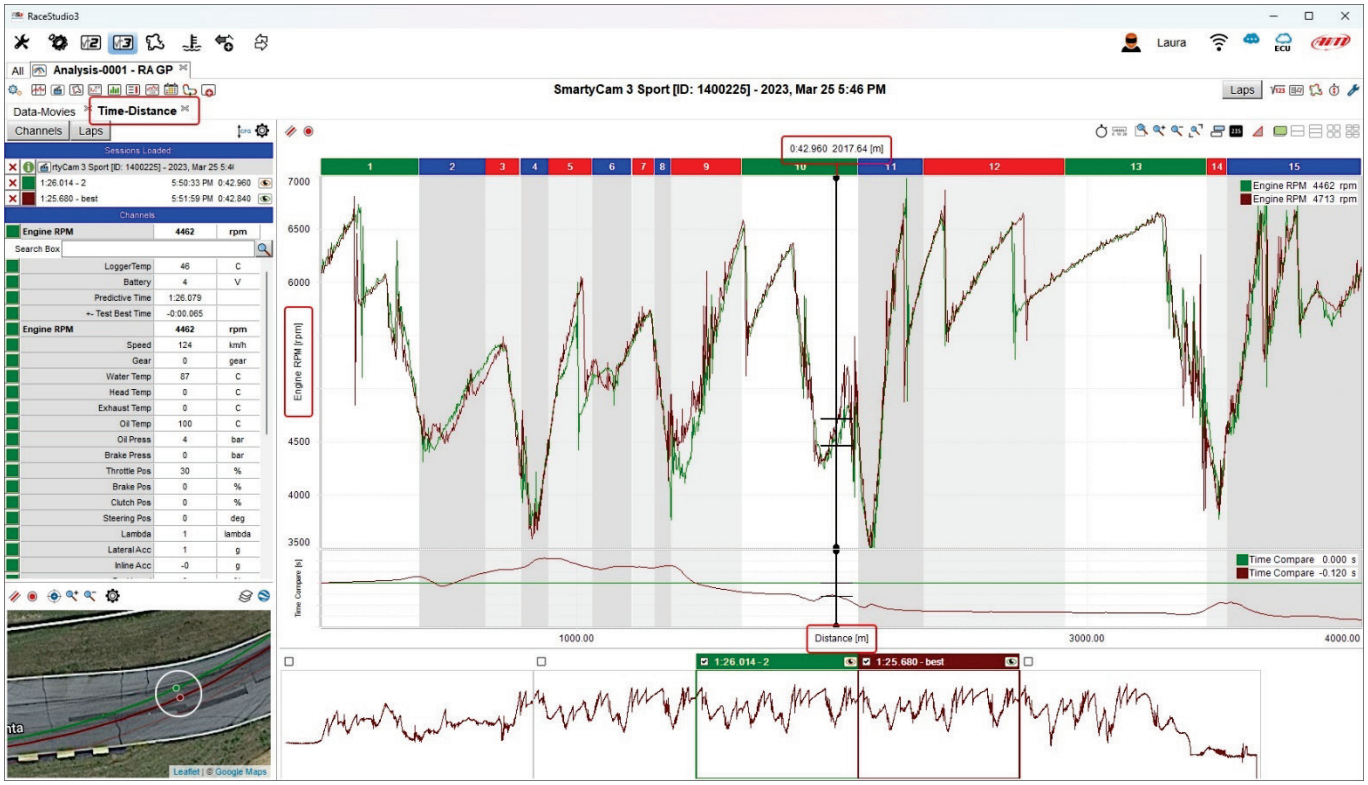


5 – Time-Distance layout

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

- channels table left of the view
- track map bottom left of the view
- in the central graph: the desired channels (RPM by default) on the ordinary axle, and the distance on the abscissa axle; the graph cursor indicates the time and below the graph, if more laps are open and time compare is enabled (paragraph 4.5.1), time compare graph is shown
- the storyboard bottom of the graph(s)

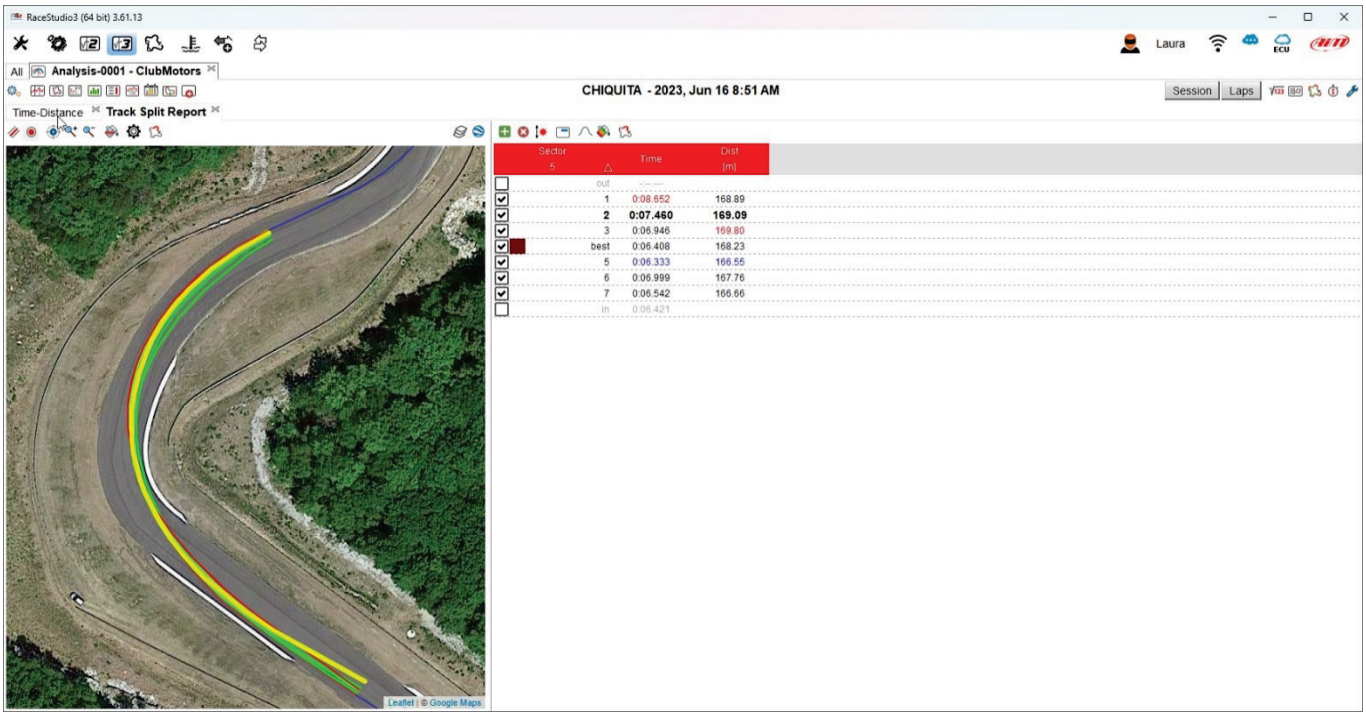
As highlighted in the image below, zooming in the track map you can see the position of the vehicle in the open laps.



6 – Track split report layout

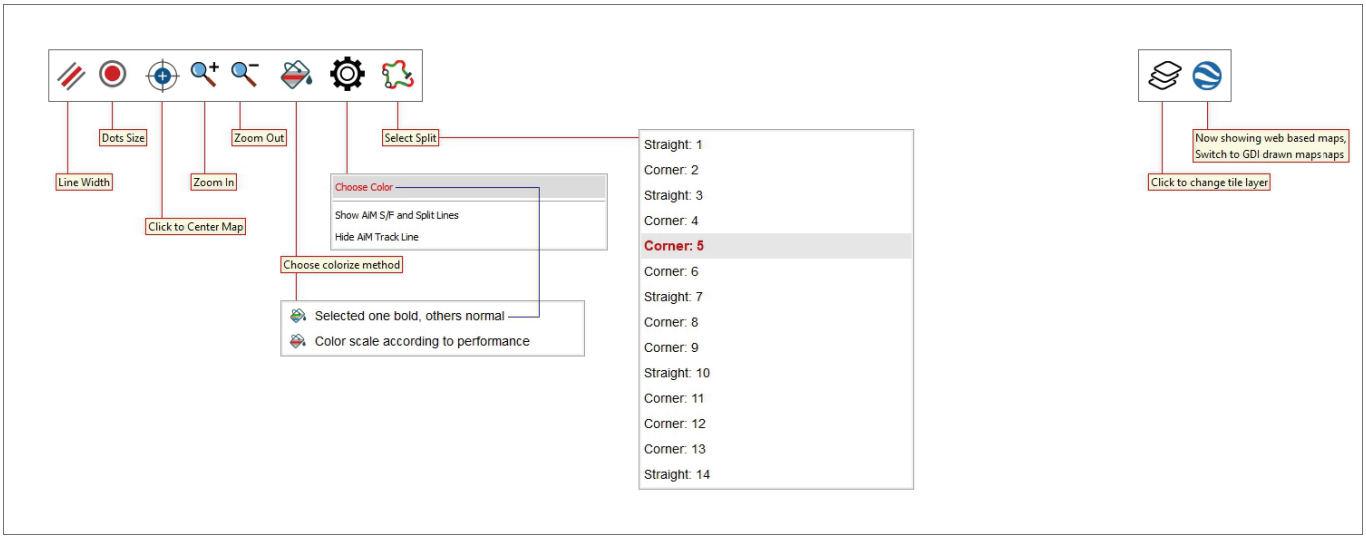
Pressing the icon shown here above on the top left keyboard of the view you enter "Track Split Report" layout. It shows:

- the selected split track map on the left (by default it selects the split where the cursor is in Time-Distance layout)
- channels report for the selected split on the right

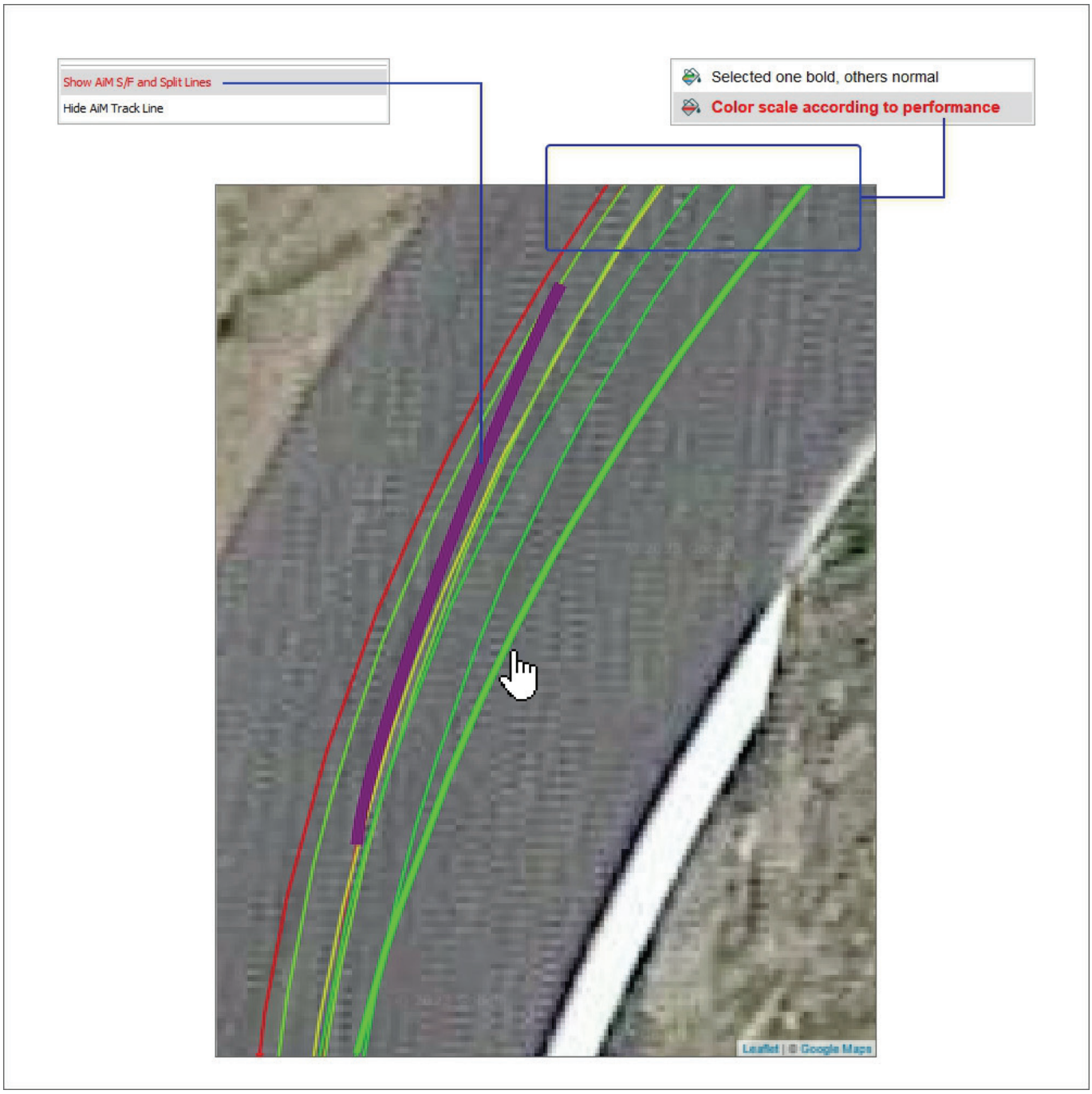


Both panels can be managed using the keyboard placed above them and explained in the following images.
Through the **map keyboard**, in addition to the usual functions (line width, dots size, centre map, zooming in/out) it is possible to:

- choose colorize method: splits are coloured according to their performance: from green for good performance to red for bad one
- show/hide AiM S/F and split line; moreover, setting colorize method "selected one bold, others normal" it is possible to change the bold one colour.
- Select a split to analyse (the one current split is highlighted in bold red in the menu)



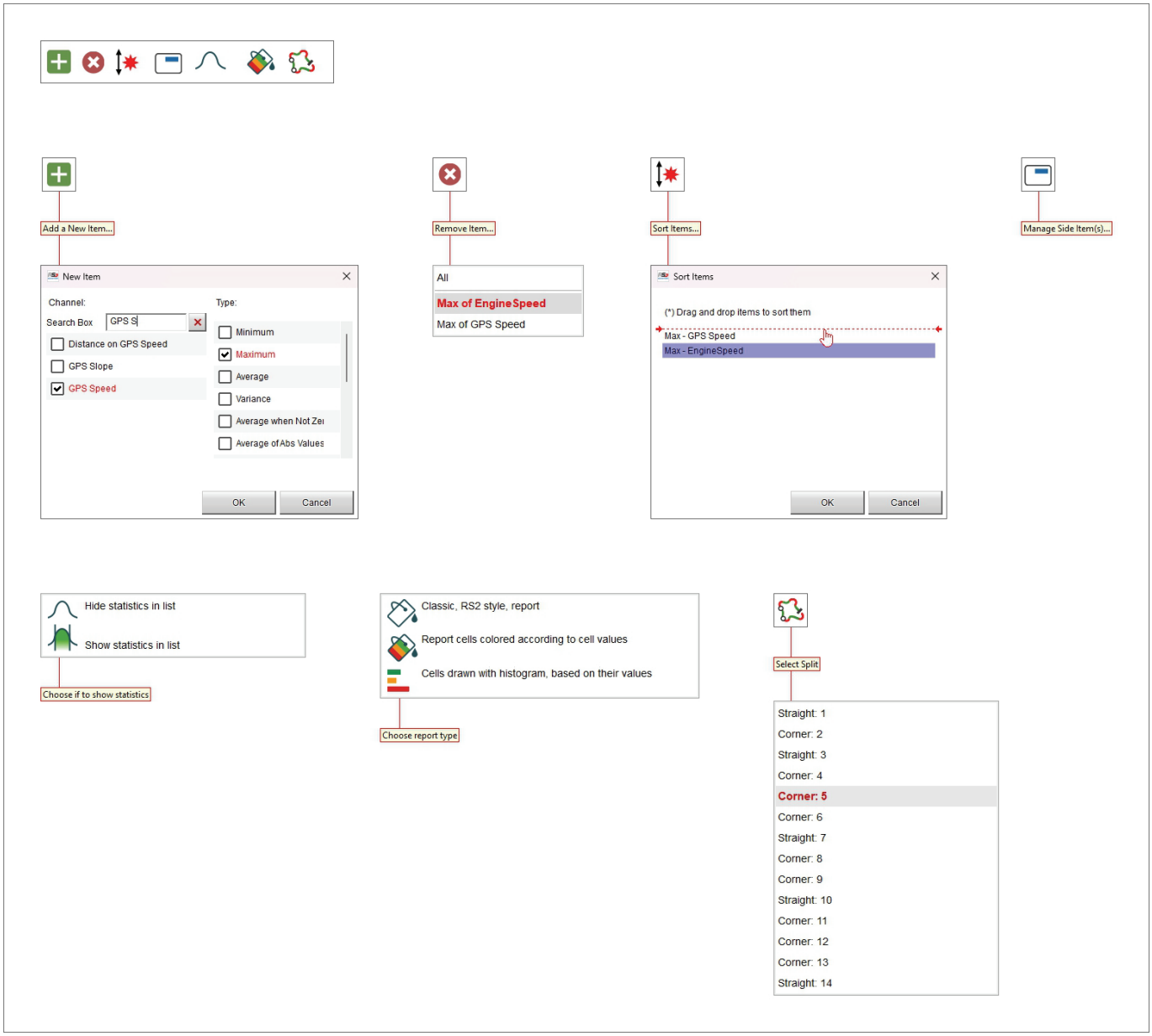
In the image below AiM Start/Finish and split lines are shown and the laps are colorized according to the performance, from green for good performance to red for bad performance.



Using the **channels report for selected split keyboard** placed right above it you can:

- Add/remove/sort/manage side items
- Show/Hide statistics
- Choose reports type
- Select splits to analyse (the one currently analysed is highlighted in bold in the list).

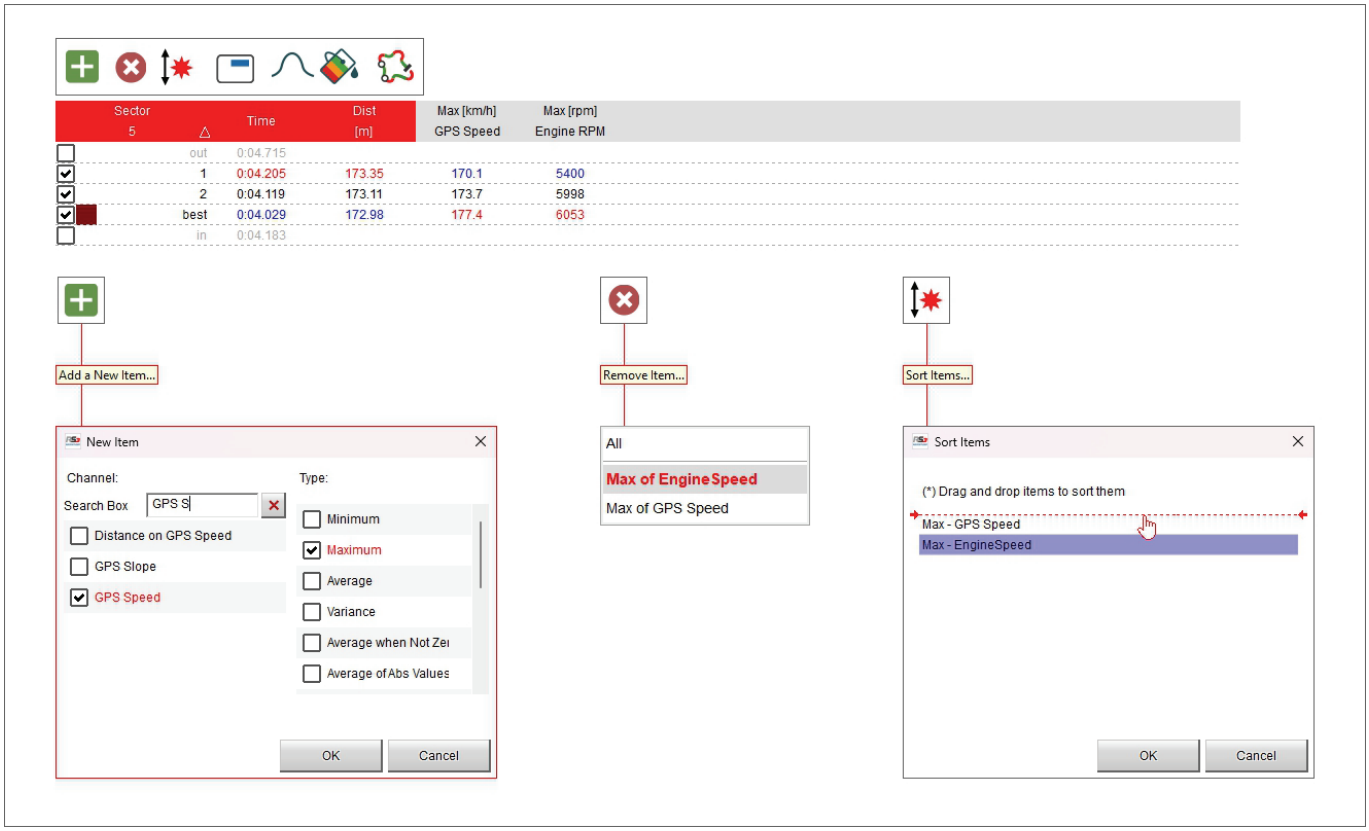
In the following paragraphs all buttons are explained.



6.1 – Adding/Removing/Sorting items

The top keyboard allows you to add/remove columns/channels to channel report right of the software view. For each channel it is possible to decide the type of value (Max, min, average, variance etc…) to show.

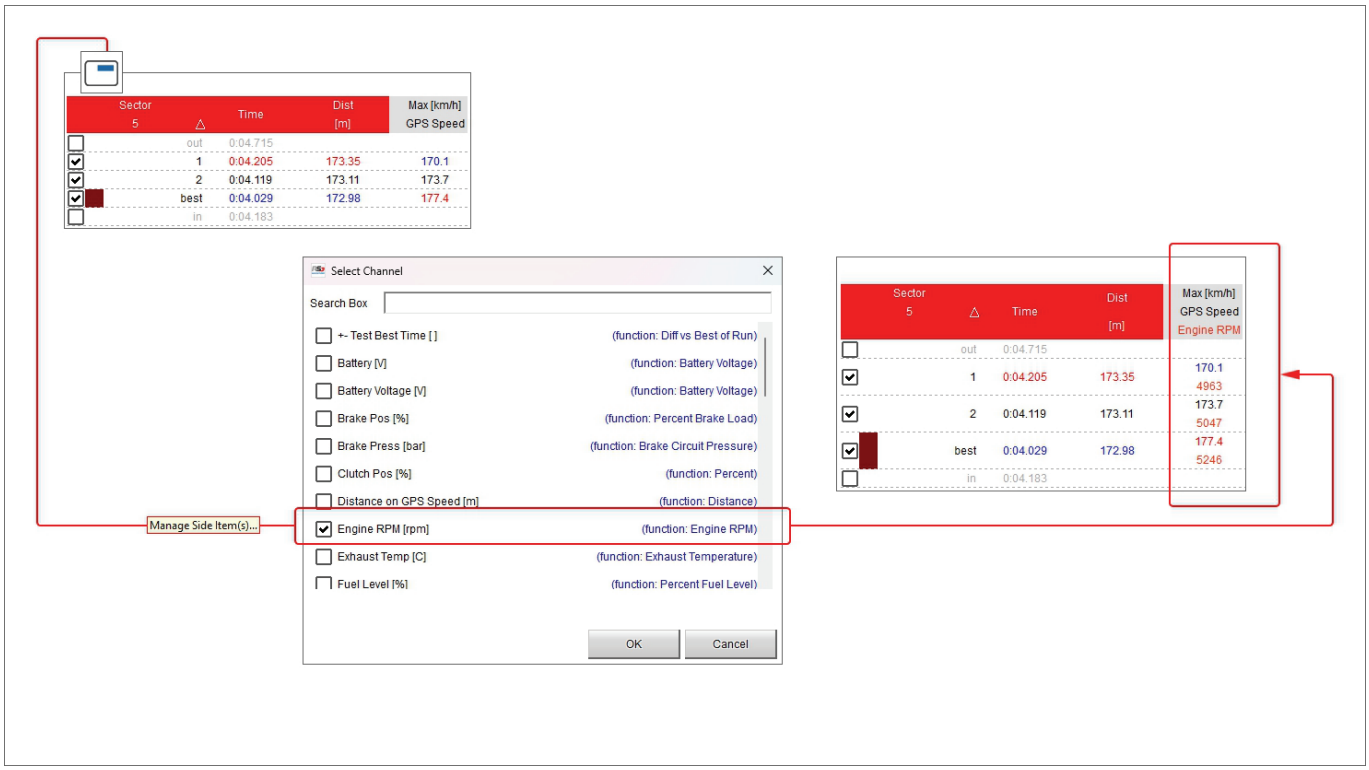
Once the channel(s) added, the software allows you to remove one or all of them and to sort the channels dragging and dropping them in the "sort Items" panel. In the example below Max GPS Speed and Max RPM value have been added and displaced.



6.2 – Managing side items

Once one or more channels have been added (Max GPS speed in the top table below), it is possible to show the values of this channel together with another one in the same point. Here below GPS Speed and RPM value are shown at the same time.

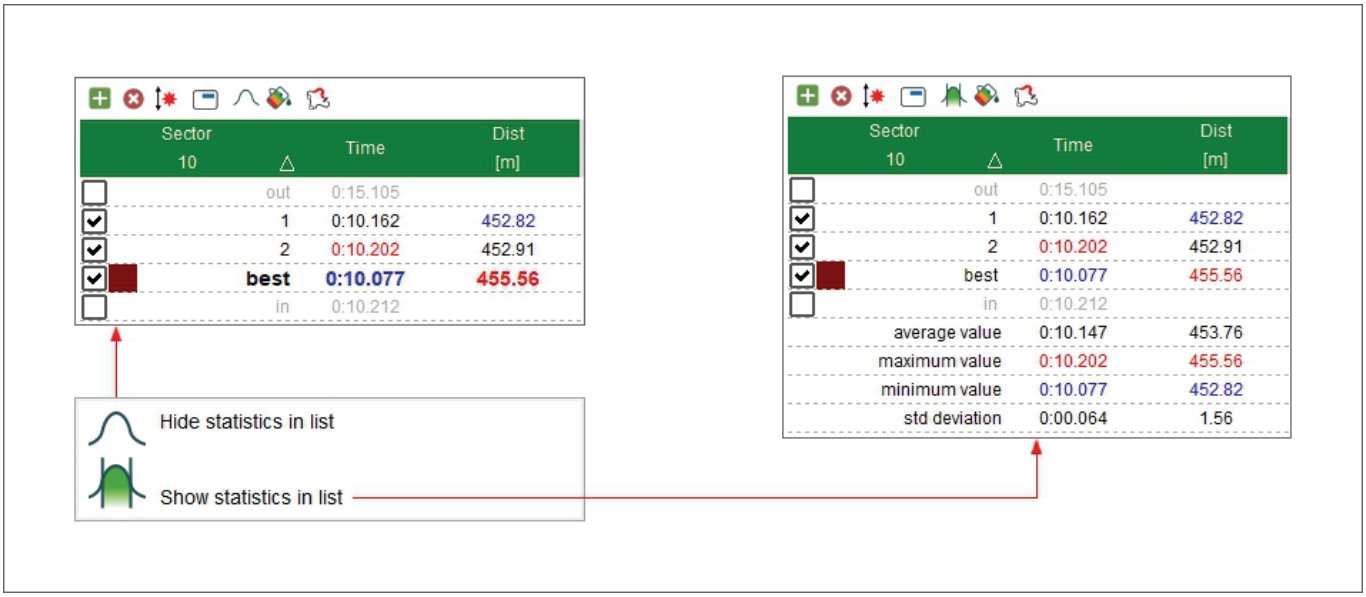
To remove this view simply click the icon again and de-select the channel.



6.3 – Showing/Hiding statistics

Bottom of channels split report table it is possible to show hide the related statistics; they show:

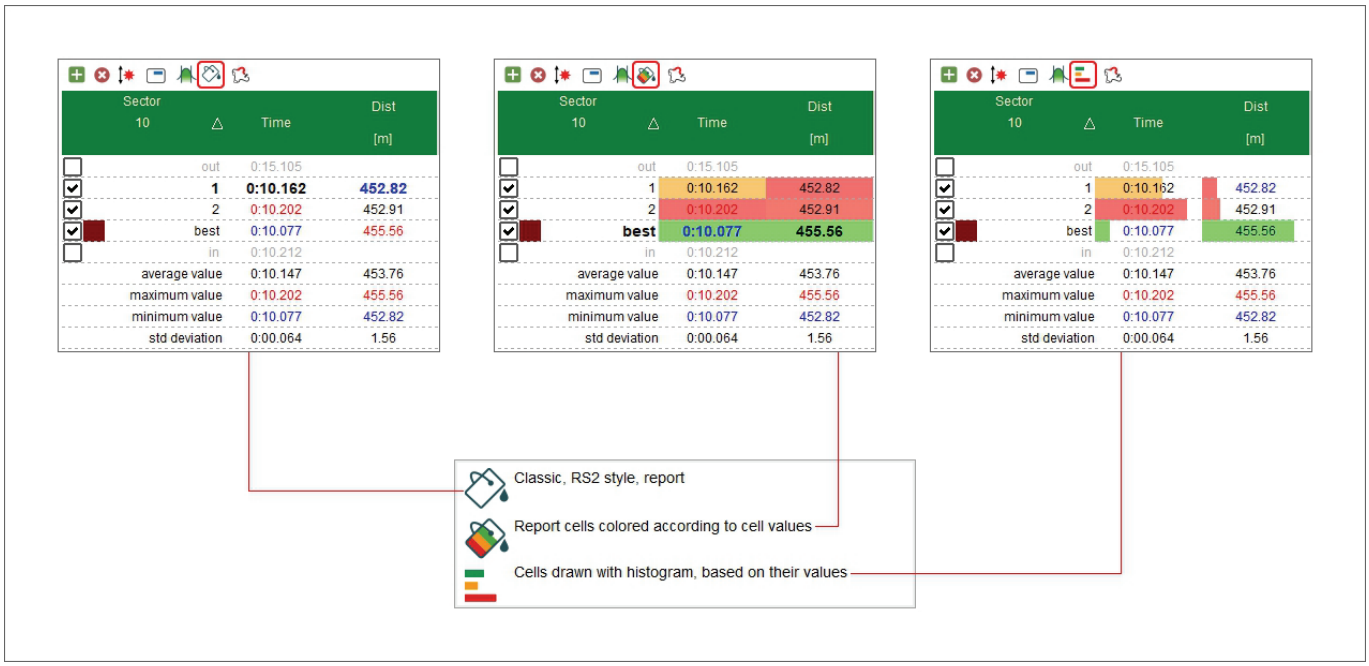
- max, min and average values of the channels reported
- standard deviation; this is a measure of the amount of variation or dispersion of a set of values; a low standard deviation indicates that the values tend to be close to the mean (also called the expected value) of the set while a high standard deviation indicates that the values are spread out over a wider range.



6.4 – Choosing the report type

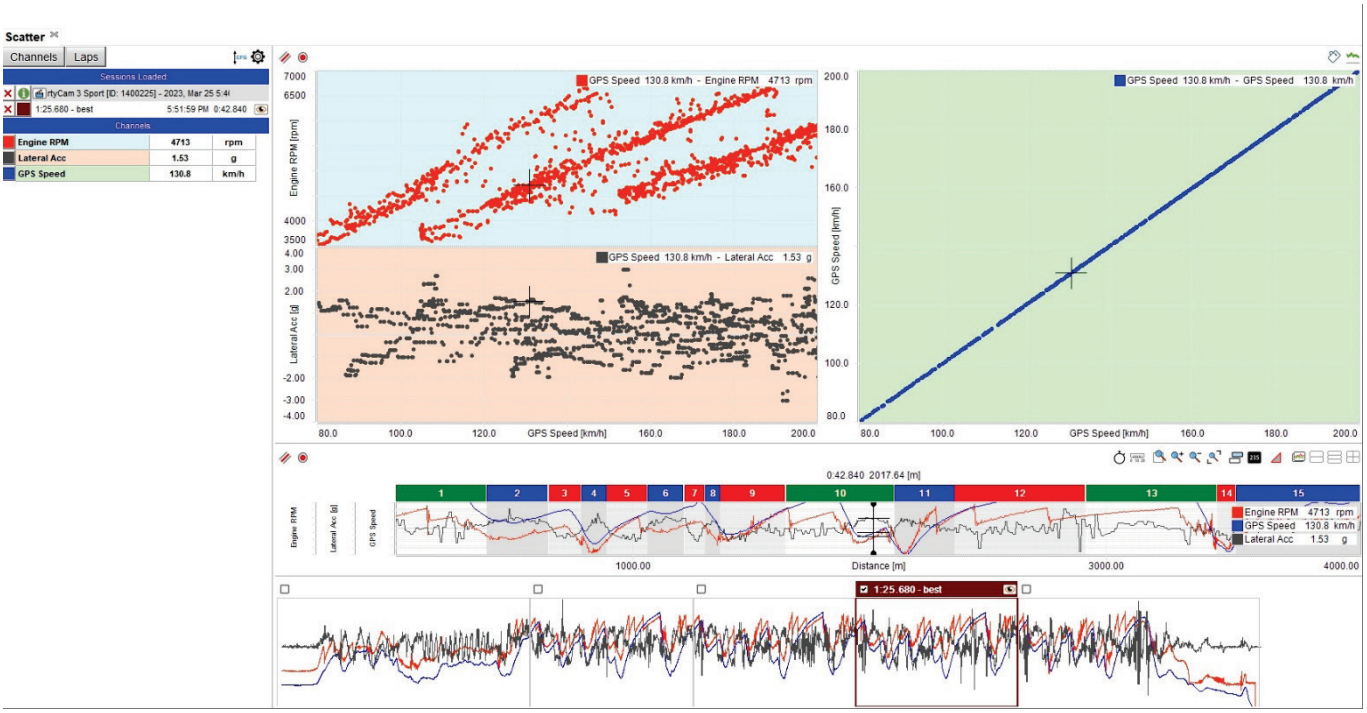
Selecting the icon here above reported it is possible to decide how to visualize split channels report table. Available options are:

- classic: it simply shows the split channel values
- report cells coloured according to cell values: each cell is coloured according to its value from green to red where green stays for good performance and red for bad performance
- cells drawn with histogram, based on their values: each cells have as background that plots as histogram the values it contains.

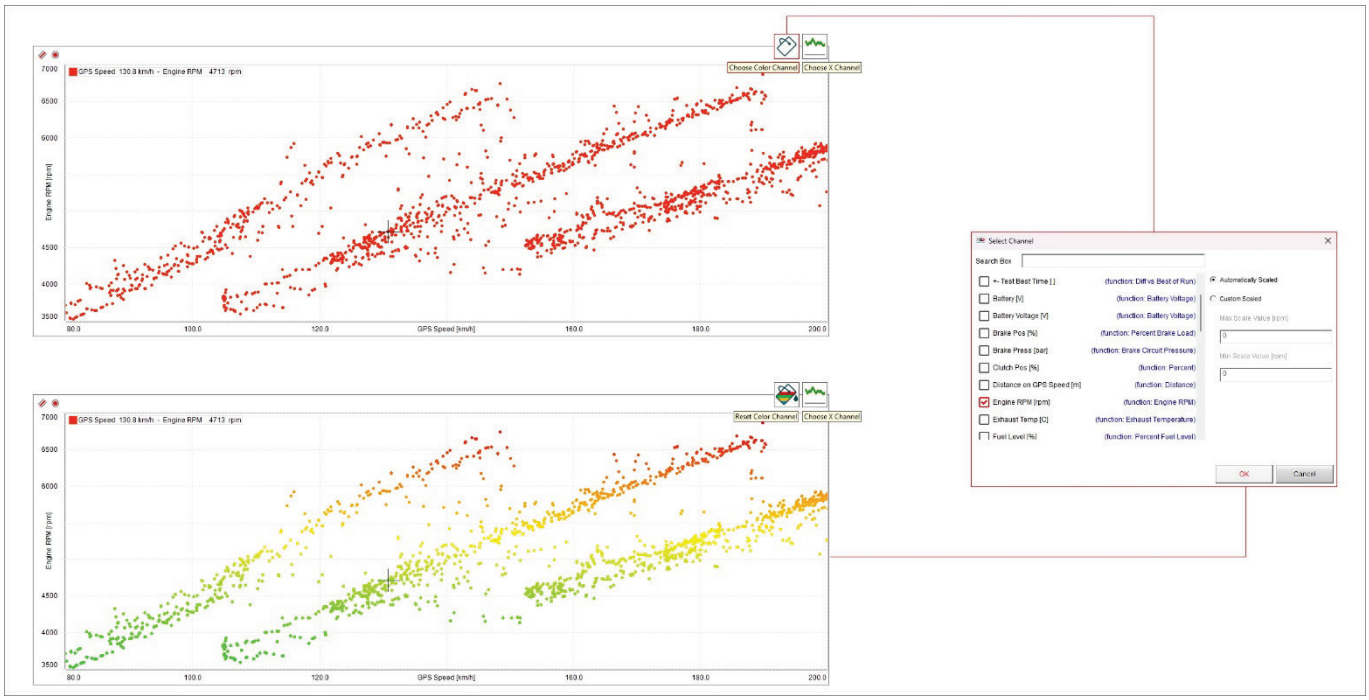


7 – Scatter Layout

Pressing the icon shown here above on the right you enter "Scatter" layout. Each channel has its own scatter graph identified by the colour of the line/dot graph that is the same of the channel in channels table. In the image below the graph background have been coloured to make channels more identifiable.
Below the graph(s) is distance or time graph of each channel or time compare graph if enabled in setting dialog window (paragraph 4.5.1). Clicking on the scatter graph the cursor in time/distance or time compare graph goes to the corresponding point.



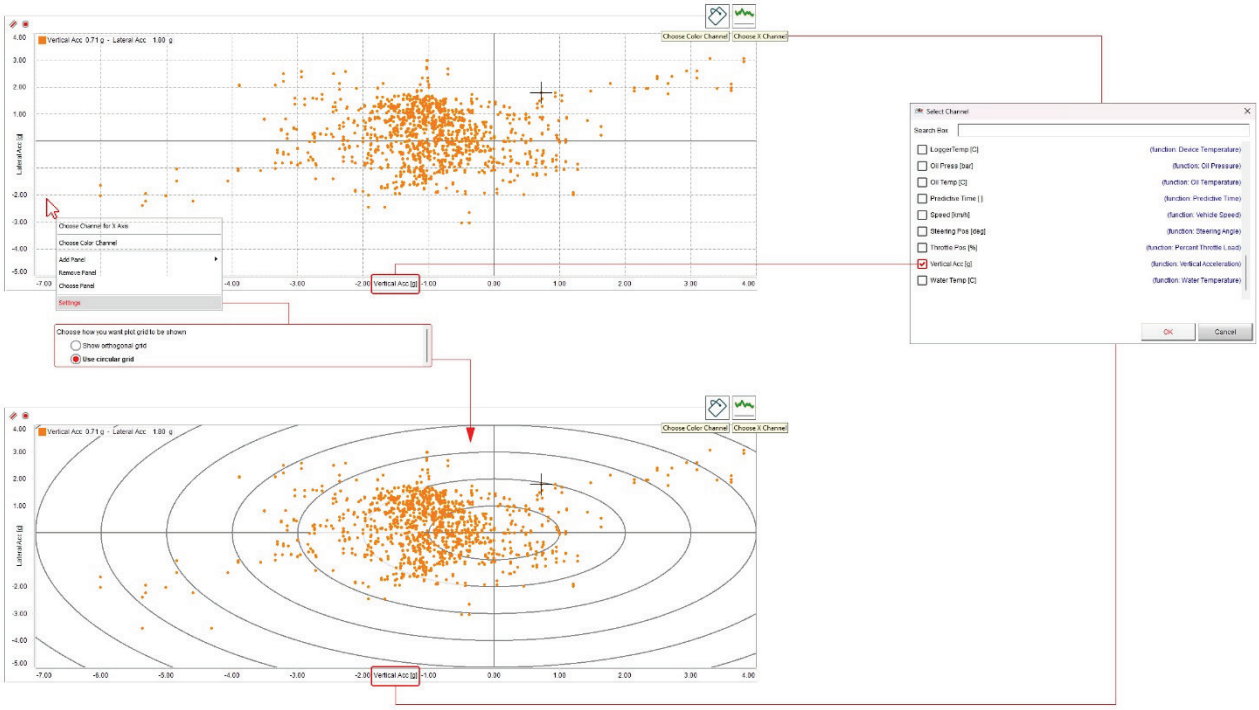
Through the top right keyboard it is possible to view a channel graph in function of another channel colourizing the graph; in the example below the graph has been colourized using Engine RPM channel. When RPM value is higher the graph is red; on the contrary where RPM value is lower the graph is green.



Using the icon right of the top keyboard ( ) it is possible to choose the abscissa channel.

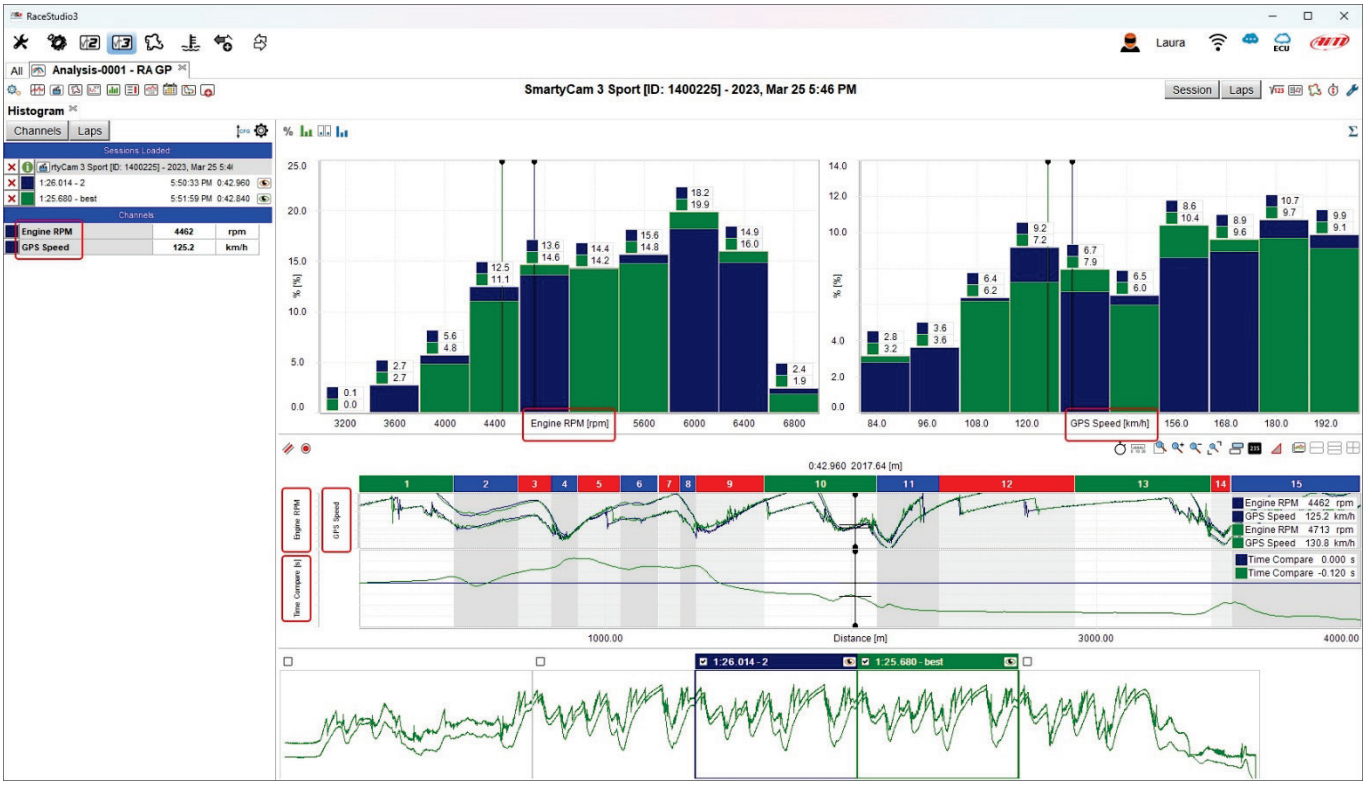
When analysing an acceleration scatter graph circular plotting grid can be useful. To show it:

- show Lateral Acceleration on the Y axle
- click “Choose X Channel” icon top right of the scatter graph
- scroll up to “Vertical Acc” channel on the panel that is prompted, select it and press “OK”
- right click on the graph and select “Setting” option
- scroll the panel up to “Choose how you want plot grid to be shown” option, select “Show circular grid” and press “OK”
- the circular grid is shown as in the bottom graph of the image below

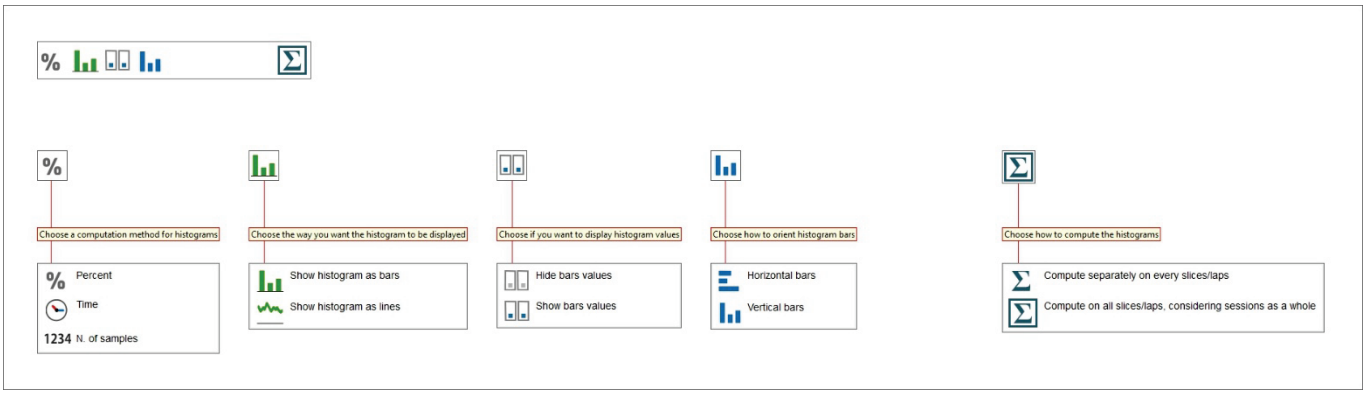


8 – Histogram Layout

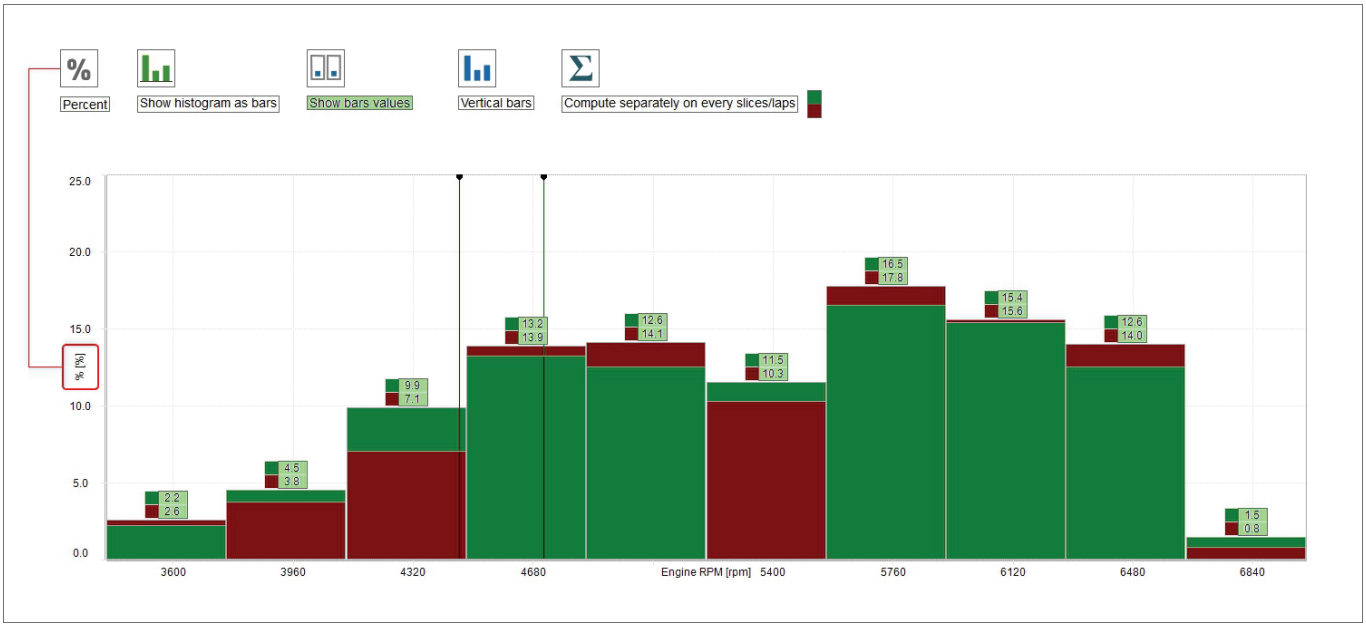
Pressing the icon shown here above you enter “Histogram” layout. Each channel has its own histogram and each lap is identified by a different colour; below the histograms is a graph of the channel on a distance base and time compare if enabled. Bottom of the graphs is the storyboard.

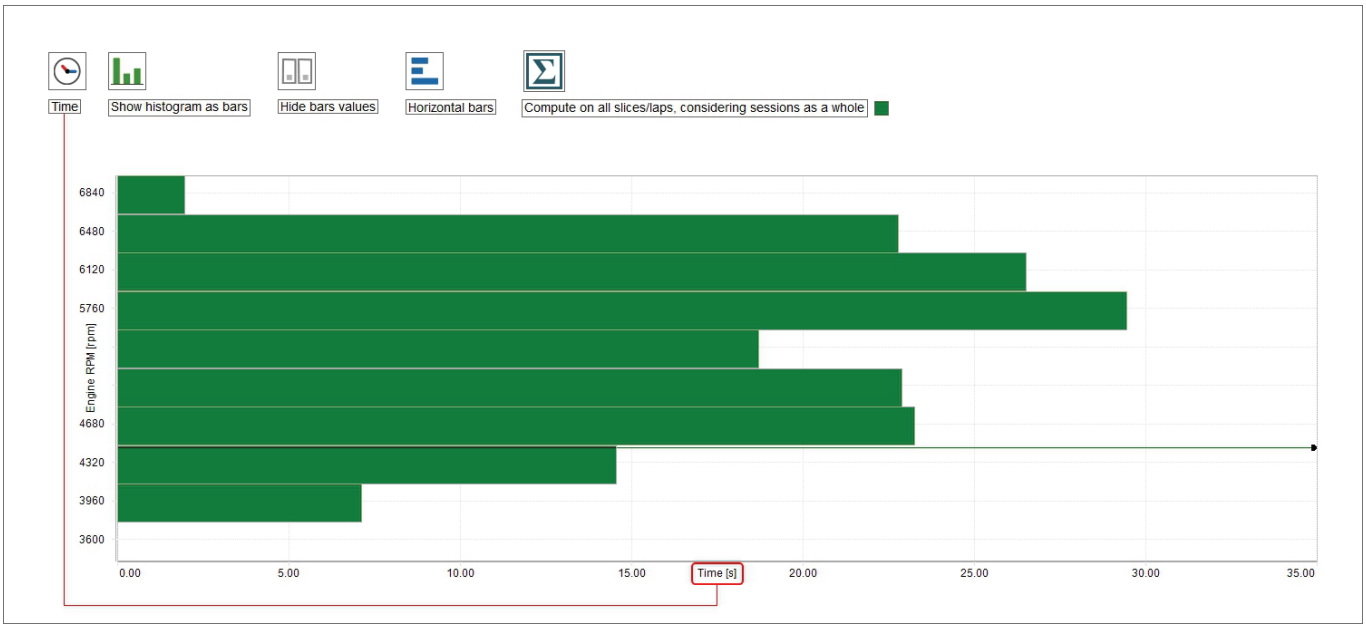


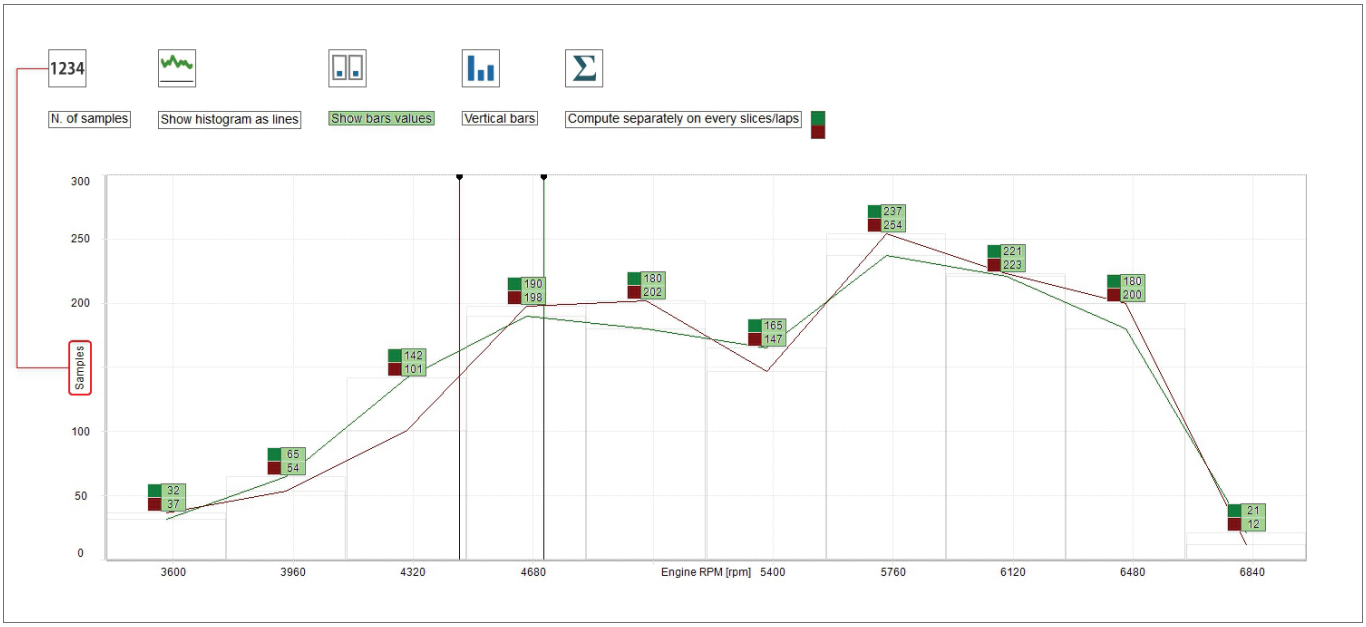
Using the icons on the toolbar top of the graph you can modify the graph layout and its computation. The graph can be shown in percentage, in time or as number of samples. Its layout can be in bars (horizontal or vertical) or lines, showing or hiding the values. If more laps/slices are shown they can be computed separately or as a whole.



The following images show the main options.



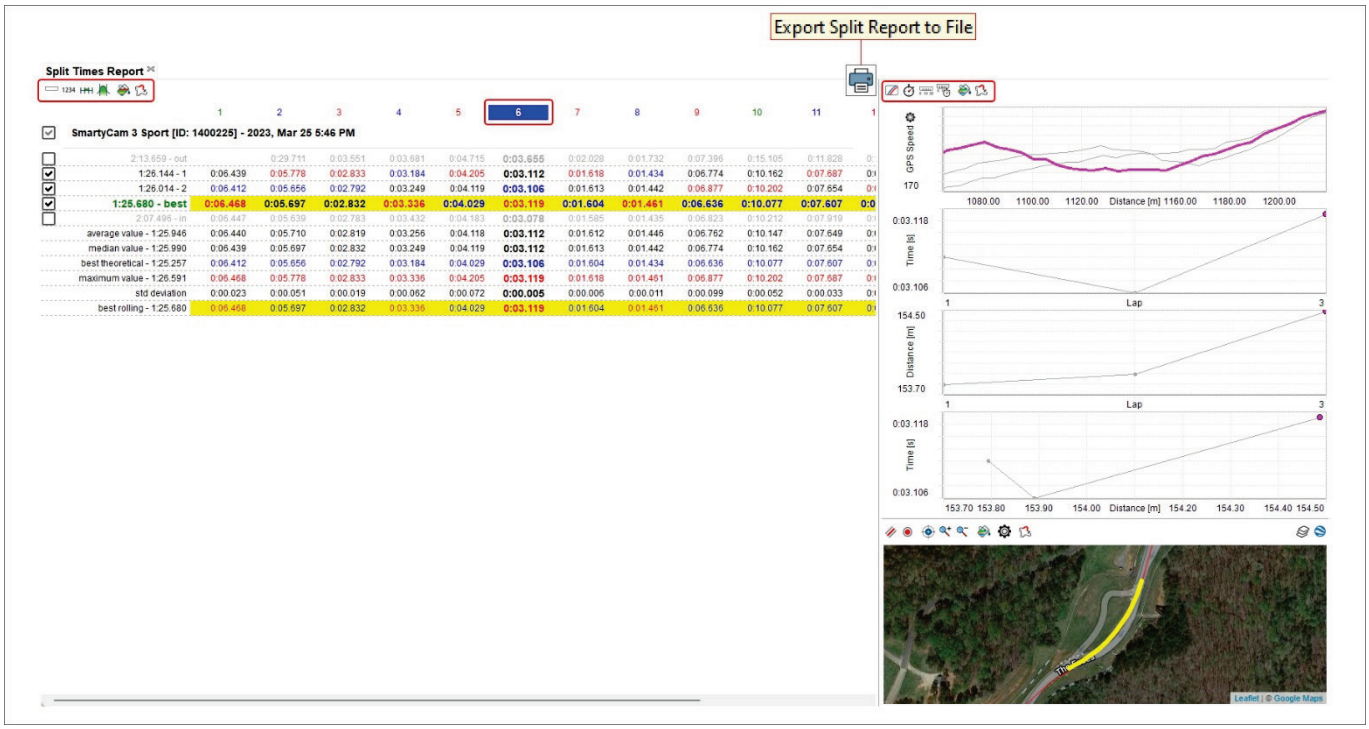

Time
Show histogram as bars
Hide bars values
Horizontal bars
Compute on all slices/laps, considering sessions as a whole
Engine RPM [rpm]
6840
6480
6120
5760
4680
4320
3960
3600
0.00
5.00
10.00
15.00
Time [s]
20.00
25.00
30.00
35.00


1234
N. of samples
Show histogram as lines
Show bars values
Vertical bars
Compute separately on every slices/laps
Samples
300
250
200
100
50
0
32
37
65
54
142
101
190
198
180
202
165
147
237
254
221
223
180
200
21
12
3600
3960
4320
4680
Engine RPM [rpm]
5400
5760
6120
6480
6840

9 – Split Times report layout

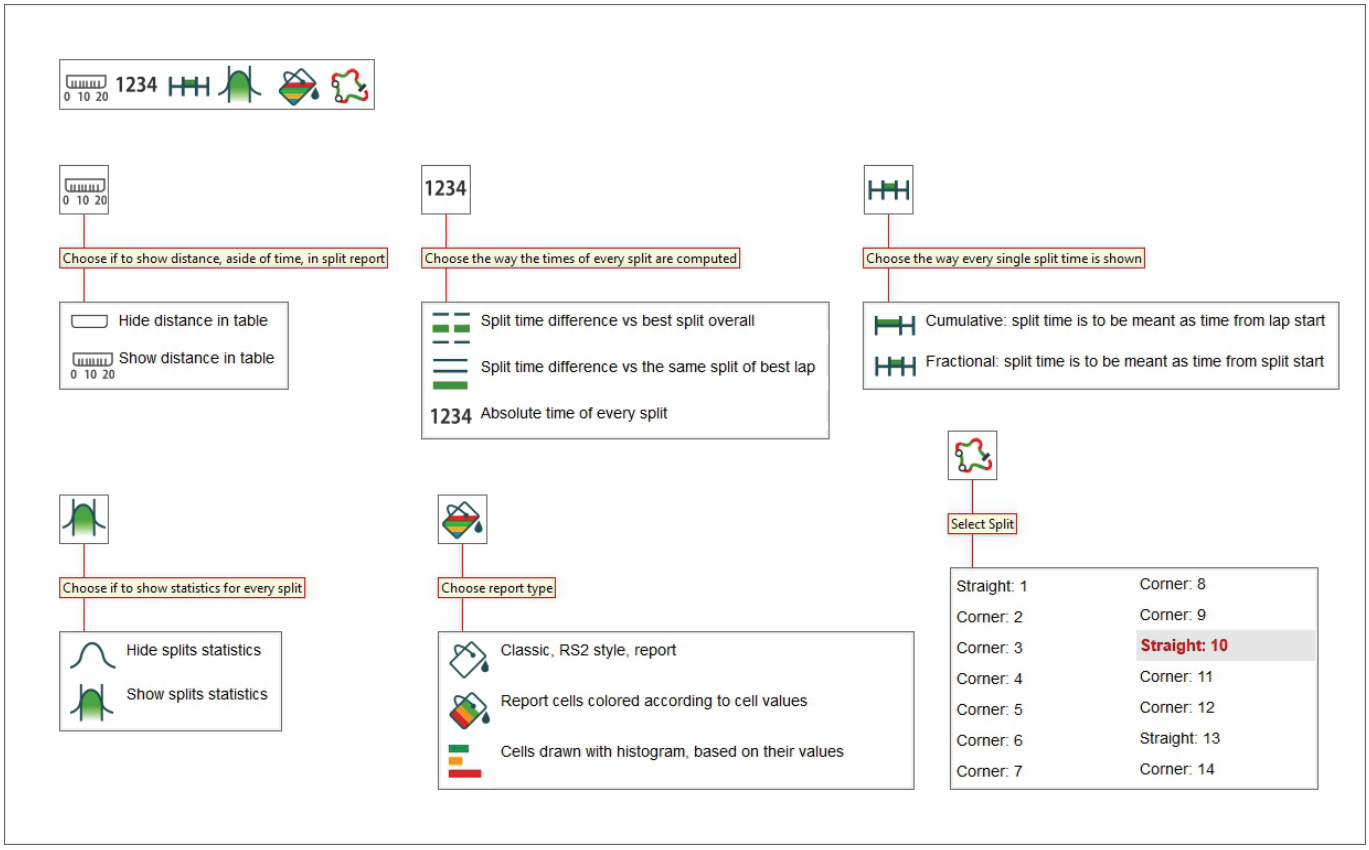
Pressing the icon shown here above on the right you enter “Split Times Report” layout. It shows:

- two keyboards left and right of the view; 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 while the printer icons highlighted below allows the user to export data in a file
- session data in the central table, with or without “Statistics” (see paragraph 6.3); each lap can be enabled/disabled checking and unchecking the corresponding checkbox on the left; the selected split is indicated by its number on a blue background top of the column in the table.
- graphs of the selected split on the right.
- track map showing the selected split bottom of the graphs

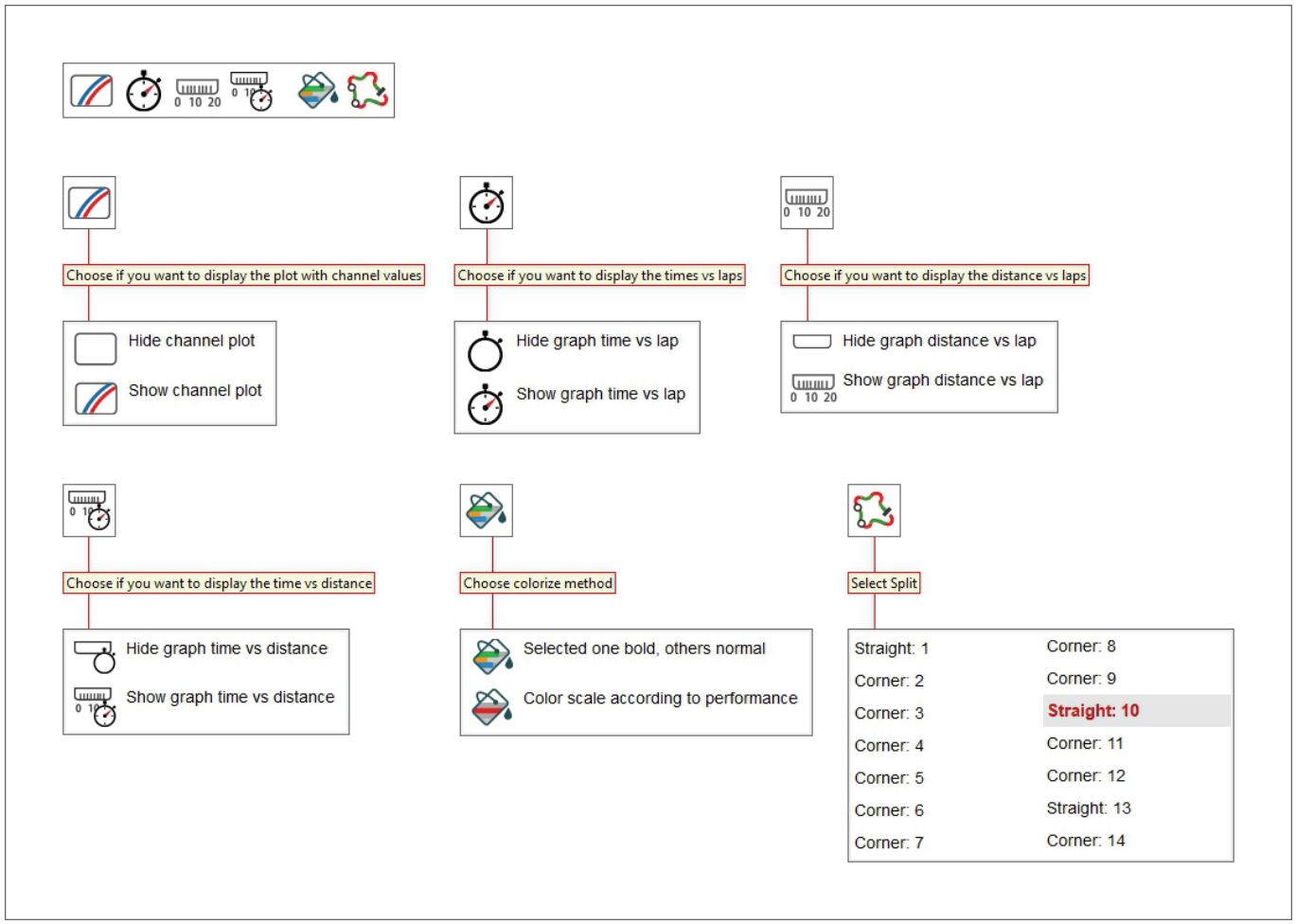


9.1 – The top keyboards

The top keyboards 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. The image below shows left keyboard legenda. It manages the table left of the software view.



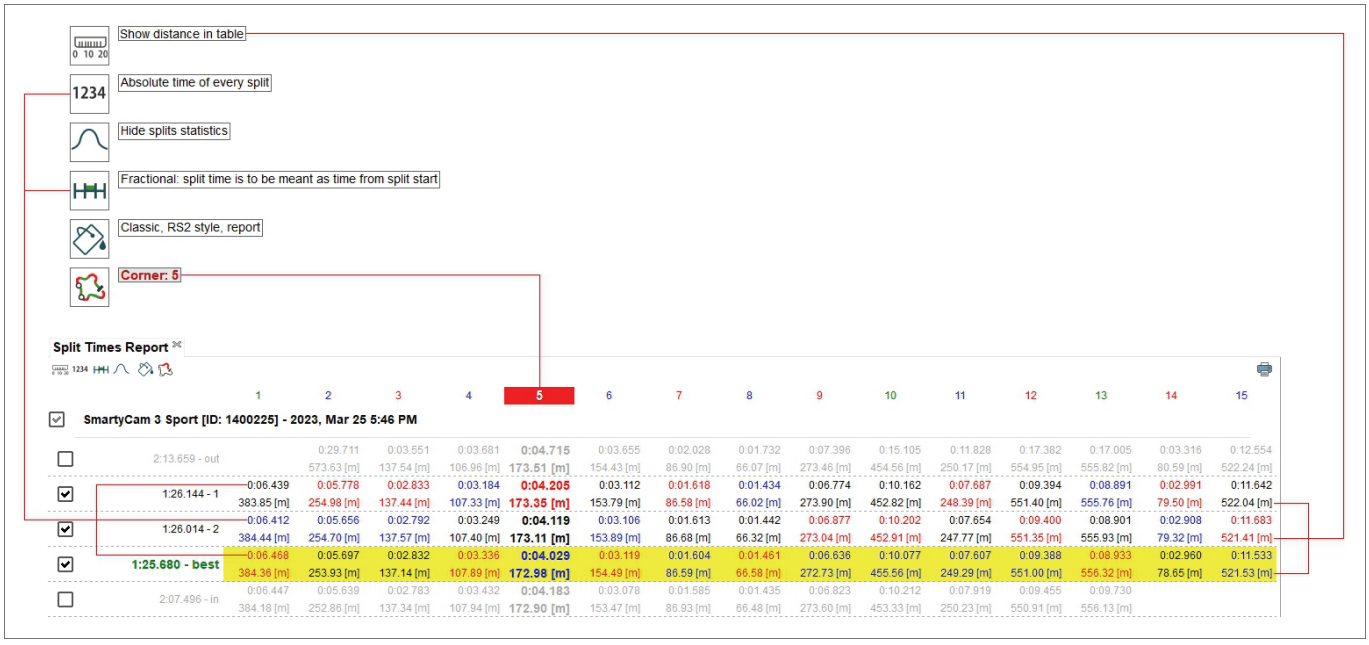
The image below shows right keyboard legenda that manages the available graphs shown below it.



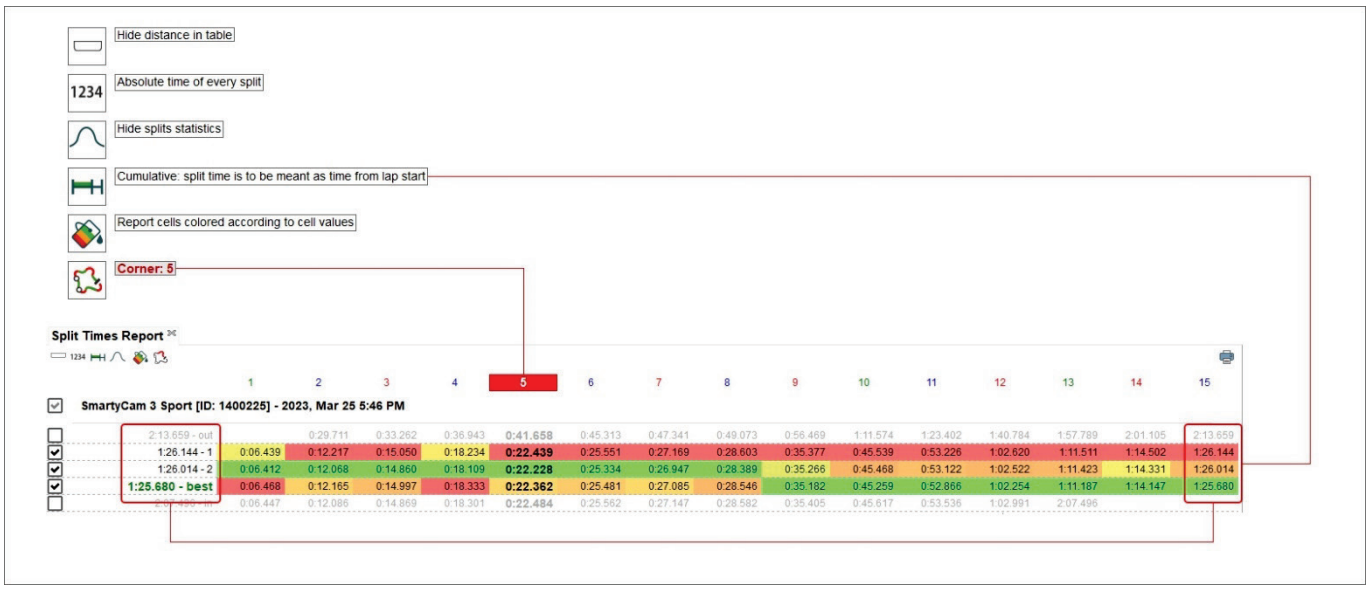
9.2 – The split report table and its available layouts

Considering the table left of the software view here follow different possible layouts.

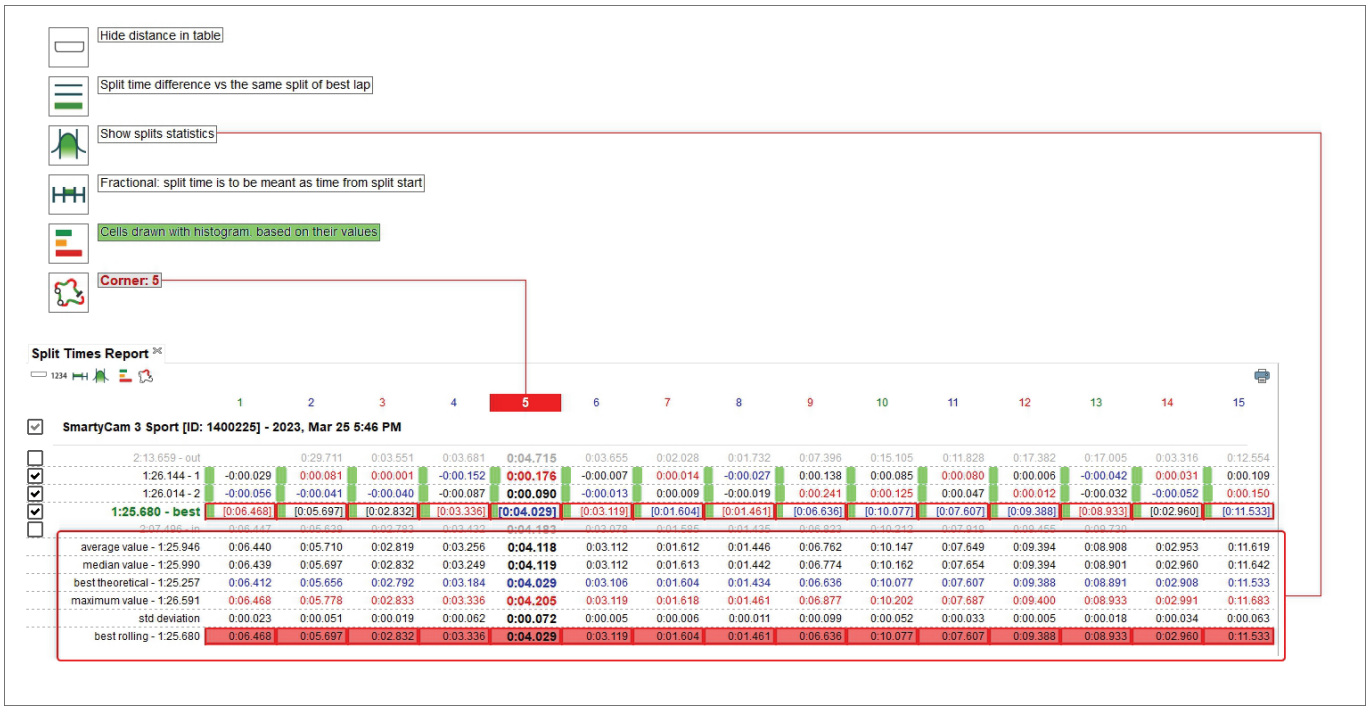
Show distance in table, absolute time of every split, fractional split time, classic RS2 style report.



Hide distance in table, absolute time of every split, cumulative split time, reports cells coloured according to cell values (from green for better values to red for worst values)**.**



Hide distance in table, split time difference vs the same split of best lap, show split statistics, fractional split time, cells draws with histogram based on their values.



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2:13.659 - out		0:29.711	0:03.551	0:03.681	**0:04.715**	0:03.655	0:02.028	0:01.732	0:07.396	0:15.105	0:11.828	0:17.382	0:17.005	0:03.316	0:12.554
1:26.144 - 1	-0:00.029	0:00.081	0:00.001	-0:00.152	**0:00.176**	-0:00.007	0:00.014	-0:00.027	0:00.138	0:00.085	0:00.080	0:00.006	-0:00.042	0:00.031	0:00.109
1:26.014 - 2	-0:00.056	-0:00.041	-0:00.040	-0:00.087	**0:00.090**	-0:00.013	0:00.009	-0:00.019	0:00.241	0:00.125	0:00.047	0:00.012	-0:00.032	-0:00.052	0:00.150
1:25.680 - best	[0:06.468]	[0:05.697]	[0:02.832]	[0:03.336]	**[0:04.029]**	[0:03.119]	[0:01.604]	[0:01.461]	[0:06.636]	[0:10.077]	[0:07.607]	[0:09.388]	[0:08.933]	[0:02.960]	[0:11.533]
2:07.496 - in	0:06.447	0:05.639	0:02.793	0:03.432	**0:04.183**	0:03.078	0:01.585	0:01.435	0:06.823	0:10.212	0:07.819	0:09.455	0:09.739		
average value - 1:25.946	0:06.440	0:05.710	0:02.819	0:03.256	**0:04.118**	0:03.112	0:01.612	0:01.446	0:06.762	0:10.147	0:07.649	0:09.394	0:08.908	0:02.953	0:11.619
median value - 1:25.990	0:06.439	0:05.697	0:02.832	0:03.249	**0:04.119**	0:03.112	0:01.613	0:01.442	0:06.774	0:10.162	0:07.654	0:09.394	0:08.901	0:02.960	0:11.642
best theoretical - 1:25.257	0:06.412	0:05.656	0:02.792	0:03.184	**0:04.029**	0:03.106	0:01.604	0:01.434	0:06.636	0:10.077	0:07.607	0:09.388	0:08.891	0:02.908	0:11.533
maximum value - 1:26.591	0:06.468	0:05.778	0:02.833	0:03.336	**0:04.205**	0:03.119	0:01.618	0:01.461	0:06.877	0:10.202	0:07.687	0:09.400	0:08.933	0:02.991	0:11.683
std deviation	0:00.023	0:00.051	0:00.019	0:00.062	**0:00.072**	0:00.005	0:00.006	0:00.011	0:00.099	0:00.052	0:00.033	0:00.005	0:00.018	0:00.034	0:00.063
best rolling - 1:25.680	0:06.468	0:05.697	0:02.832	0:03.336	**0:04.029**	0:03.119	0:01.604	0:01.461	0:06.636	0:10.077	0:07.607	0:09.388	0:08.933	0:02.960	0:11.533

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

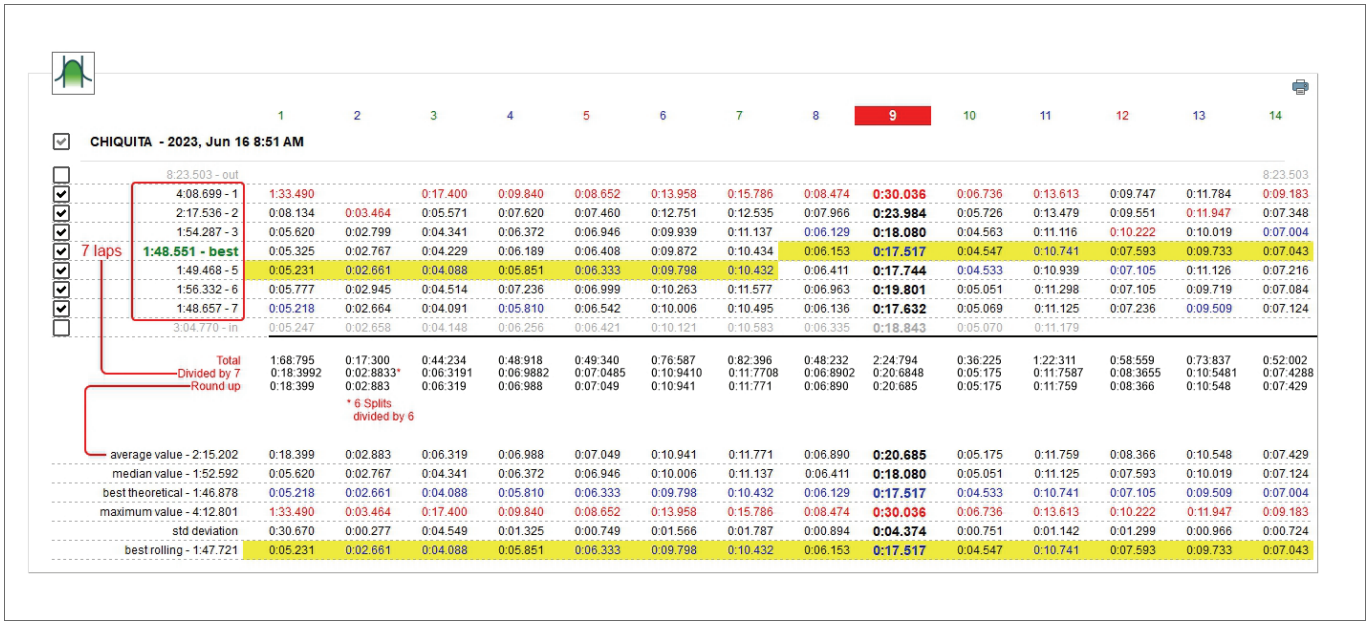
- Average value: it shows the average[1] time value of each split (see paragraph 9.2.1)
- Median value: it shows the median[2] time value of each split (see paragraph 9.2.2)
- Best theoretical: this lap time is the addition of all best split times no matter what lap they belong to (see paragraph 9.2.3)
- Maximum value: it's the higher time obtained for each split; these values are written in red in the dedicated statistics row
- 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).

[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 – Statistics: 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 except for split 2 where the time of lap 1 is missing and so that sum is to be divided by 6.

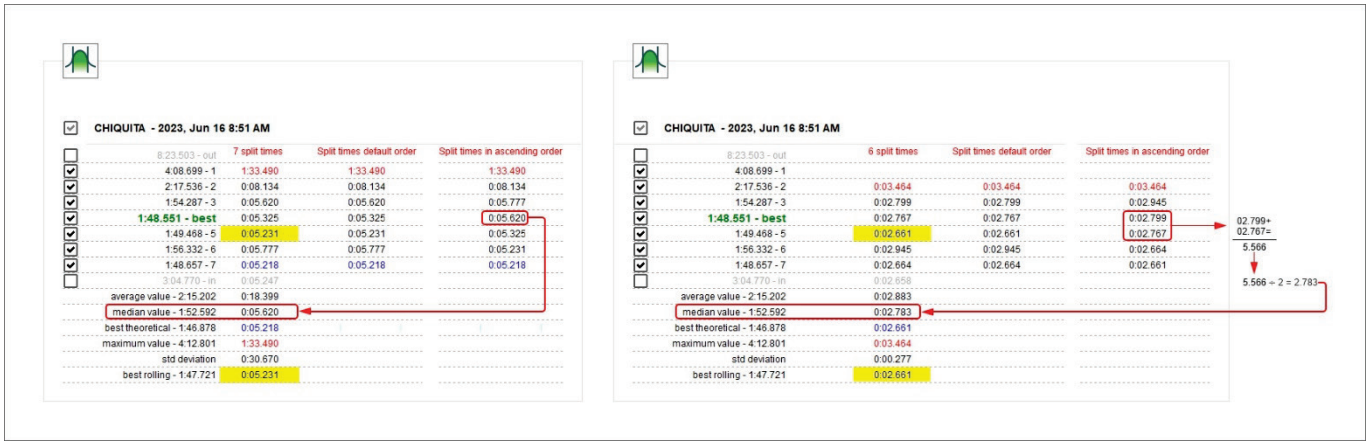


CHIQUITA - 2023, Jun 16 8:51 AM

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
8:23.503 - out														8:23.503
4:08.699 - 1	1:33.490		0:17.400	0:09.840	0:08.652	0:13.958	0:15.786	0:08.474	**0:30.036**	0:06.736	0:13.613	0:09.747	0:11.784	0:09.183
2:17.536 - 2	0:08.134	0:03.464	0:05.571	0:07.620	0:07.460	0:12.751	0:12.535	0:07.966	**0:23.984**	0:05.726	0:13.479	0:09.551	0:11.947	0:07.348
1:54.287 - 3	0:05.620	0:02.799	0:04.341	0:06.372	0:06.946	0:09.939	0:11.137	0:06.129	**0:18.080**	0:04.563	0:11.116	0:10.222	0:10.019	0:07.004
7 laps **1:48.551 - best**	0:05.325	0:02.767	0:04.229	0:06.189	0:06.408	0:09.872	0:10.434	0:06.153	**0:17.517**	0:04.547	0:10.741	0:07.593	0:09.733	0:07.043
1:49.468 - 5	0:05.231	0:02.661	0:04.088	0:05.851	0:06.333	0:09.798	0:10.432	0:06.411	**0:17.744**	0:04.533	0:10.939	0:07.105	0:11.126	0:07.216
1:56.332 - 6	0:05.777	0:02.945	0:04.514	0:07.236	0:06.999	0:10.263	0:11.577	0:06.963	**0:19.801**	0:05.051	0:11.298	0:07.105	0:09.719	0:07.084
1:48.657 - 7	0:05.218	0:02.664	0:04.091	0:05.810	0:06.542	0:10.006	0:10.495	0:06.136	**0:17.632**	0:05.069	0:11.125	0:07.236	0:09.509	0:07.124
3:04.770 - in	0:05.247	0:02.658	0:04.148	0:06.256	0:06.421	0:10.121	0:10.583	0:06.335	**0:18.843**	0:05.070	0:11.179			
Total	1:68.795	0:17.300	0:44.234	0:48.918	0:49.340	0:76.587	0:82.396	0:48.232	2:24.794	0:36.225	1:22.311	0:58.559	0:73.837	0:52.002
Divided by 7	0:18.3992	0:02.8833*	0:06.3191	0:06.9882	0:07.0485	0:10.9410	0:11.7708	0:06.8902	0:20.6848	0:05.175	0:11.7587	0:08.3655	0:10.5481	0:07.4288
Round up	0:18.399	0:02.883	0:06.319	0:06.988	0:07.049	0:10.941	0:11.771	0:06.890	0:20.685	0:05.175	0:11.759	0:08.366	0:10.548	0:07.429
		* 6 Splits divided by 6												
average value - 2:15.202	0:18.399	0:02.883	0:06.319	0:06.988	0:07.049	0:10.941	0:11.771	0:06.890	**0:20.685**	0:05.175	0:11.759	0:08.366	0:10.548	0:07.429
median value - 1:52.592	0:05.620	0:02.767	0:04.341	0:06.372	0:06.946	0:10.006	0:11.137	0:06.411	**0:18.080**	0:05.051	0:11.125	0:07.593	0:10.019	0:07.124
best theoretical - 1:46.878	0:05.218	0:02.661	0:04.088	0:05.810	0:06.333	0:09.798	0:10.432	0:06.129	**0:17.517**	0:04.533	0:10.741	0:07.105	0:09.509	0:07.004
maximum value - 4:12.801	1:33.490	0:03.464	0:17.400	0:09.840	0:08.652	0:13.958	0:15.786	0:08.474	**0:30.036**	0:06.736	0:13.613	0:10.222	0:11.947	0:09.183
std deviation	0:30.670	0:00.277	0:04.549	0:01.325	0:00.749	0:01.566	0:01.787	0:00.894	**0:04.374**	0:00.751	0:01.142	0:01.299	0:00.966	0:00.724
best rolling - 1:47.721	0:05.231	0:02.661	0:04.088	0:05.851	0:06.333	0:09.798	0:10.432	0:06.153	**0:17.517**	0:04.547	0:10.741	0:07.593	0:09.733	0:07.043

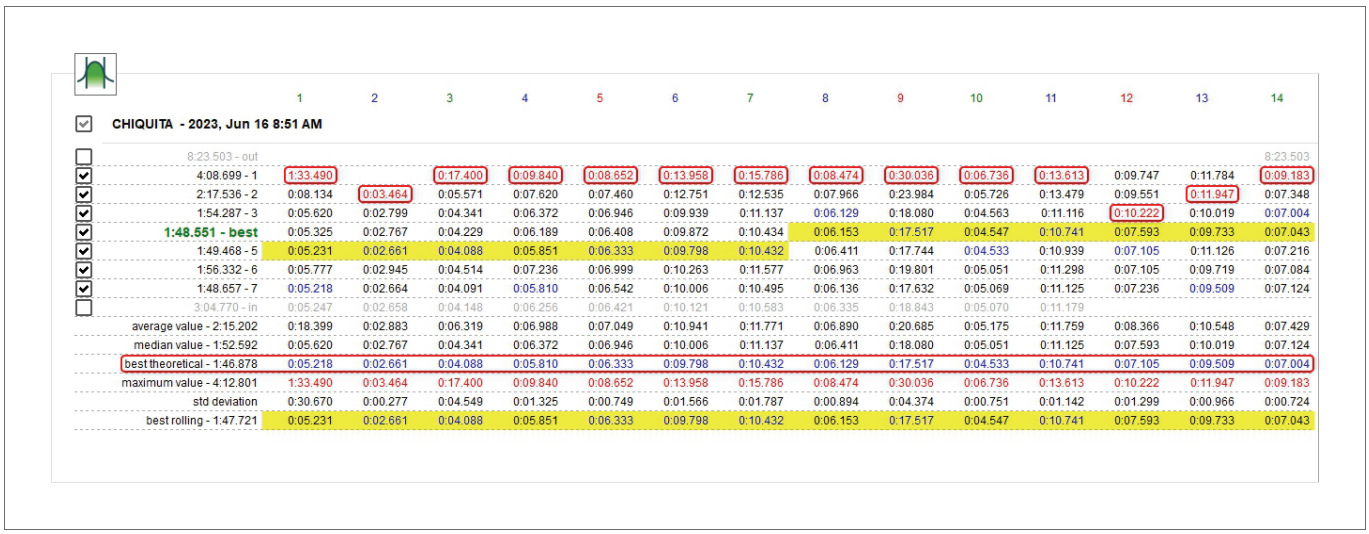
9.2.2 – Statistics: median value

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 (left image) while if the number of items is even the median value is the average value of the two central items of the list (right image).



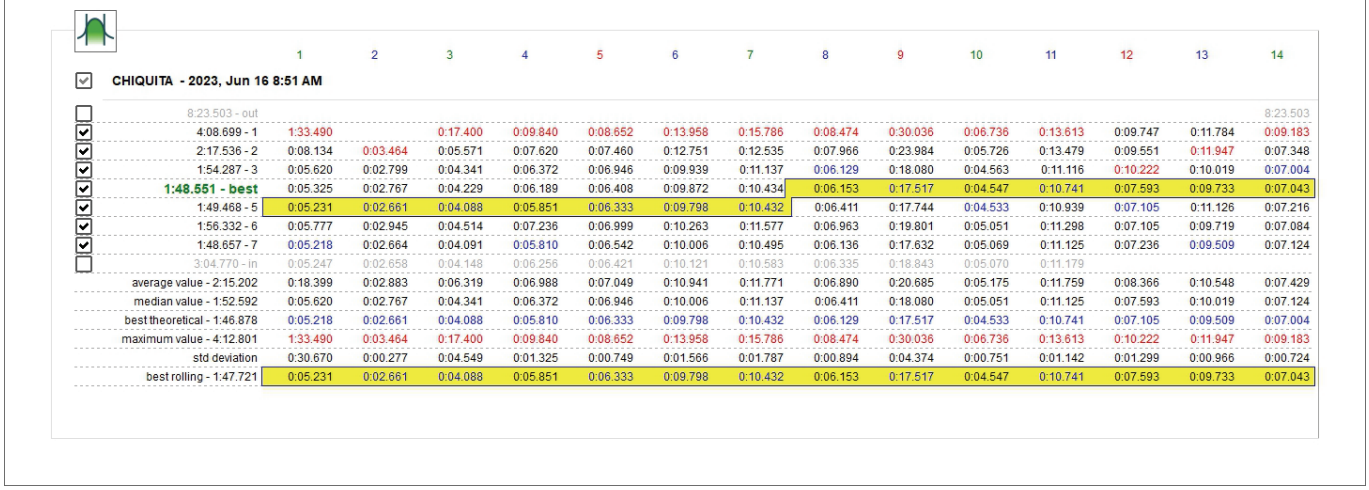
9.2.3 – Statistics: best theoretical time

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.



9.2.4 – Statistics: 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.

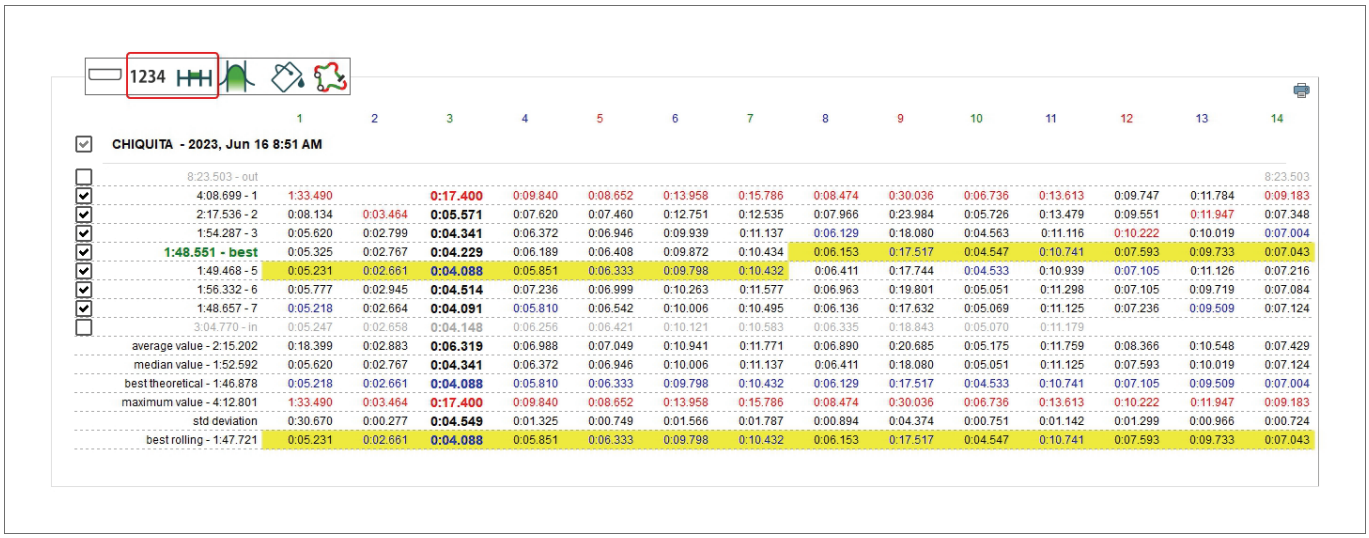


CHIQUITA - 2023, Jun 16 8:51 AM

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
8:23.503 - out														8:23.503
4:08.699 - 1	1:33.490		0:17.400	0:09.840	0:08.652	0:13.958	0:15.786	0:08.474	0:30.036	0:06.736	0:13.613	0:09.747	0:11.784	0:09.183
2:17.536 - 2	0:08.134	0:03.464	0:05.571	0:07.620	0:07.460	0:12.751	0:12.535	0:07.966	0:23.984	0:05.726	0:13.479	0:09.551	0:11.947	0:07.348
1:54.287 - 3	0:05.620	0:02.799	0:04.341	0:06.372	0:06.946	0:09.939	0:11.137	0:06.129	0:18.080	0:04.563	0:11.116	0:10.222	0:10.019	0:07.004
1:48.551 - best	0:05.325	0:02.767	0:04.229	0:06.189	0:06.408	0:09.872	0:10.434	0:06.153	0:17.517	0:04.547	0:10.741	0:07.593	0:09.733	0:07.043
1:49.468 - 5	0:05.231	0:02.661	0:04.088	0:05.851	0:06.333	0:09.798	0:10.432	0:06.411	0:17.744	0:04.533	0:10.939	0:07.105	0:11.126	0:07.216
1:56.332 - 6	0:05.777	0:02.945	0:04.514	0:07.236	0:06.999	0:10.263	0:11.577	0:06.963	0:19.801	0:05.051	0:11.298	0:07.105	0:09.719	0:07.084
1:48.657 - 7	0:05.218	0:02.664	0:04.091	0:05.810	0:06.542	0:10.006	0:10.495	0:06.136	0:17.632	0:05.069	0:11.125	0:07.236	0:09.509	0:07.124
3:04.770 - in	0:05.247	0:02.658	0:04.148	0:06.256	0:06.421	0:10.121	0:10.583	0:06.335	0:18.843	0:05.070	0:11.179			
average value - 2:15.202	0:18.399	0:02.883	0:06.319	0:06.988	0:07.049	0:10.941	0:11.771	0:06.890	0:20.685	0:05.175	0:11.759	0:08.366	0:10.548	0:07.429
median value - 1:52.592	0:05.620	0:02.767	0:04.341	0:06.372	0:06.946	0:10.006	0:11.137	0:06.411	0:18.080	0:05.051	0:11.125	0:07.593	0:10.019	0:07.124
best theoretical - 1:46.878	0:05.218	0:02.661	0:04.088	0:05.810	0:06.333	0:09.798	0:10.432	0:06.129	0:17.517	0:04.533	0:10.741	0:07.105	0:09.509	0:07.004
maximum value - 4:12.801	1:33.490	0:03.464	0:17.400	0:09.840	0:08.652	0:13.958	0:15.786	0:08.474	0:30.036	0:06.736	0:13.613	0:10.222	0:11.947	0:09.183
std deviation	0:30.670	0:00.277	0:04.549	0:01.325	0:00.749	0:01.566	0:01.787	0:00.894	0:04.374	0:00.751	0:01.142	0:01.299	0:00.966	0:00.724
best rolling - 1:47.721	0:05.231	0:02.661	0:04.088	0:05.851	0:06.333	0:09.798	0:10.432	0:06.153	0:17.517	0:04.547	0:10.741	0:07.593	0:09.733	0:07.043

9.3 – Absolute fractional mode

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

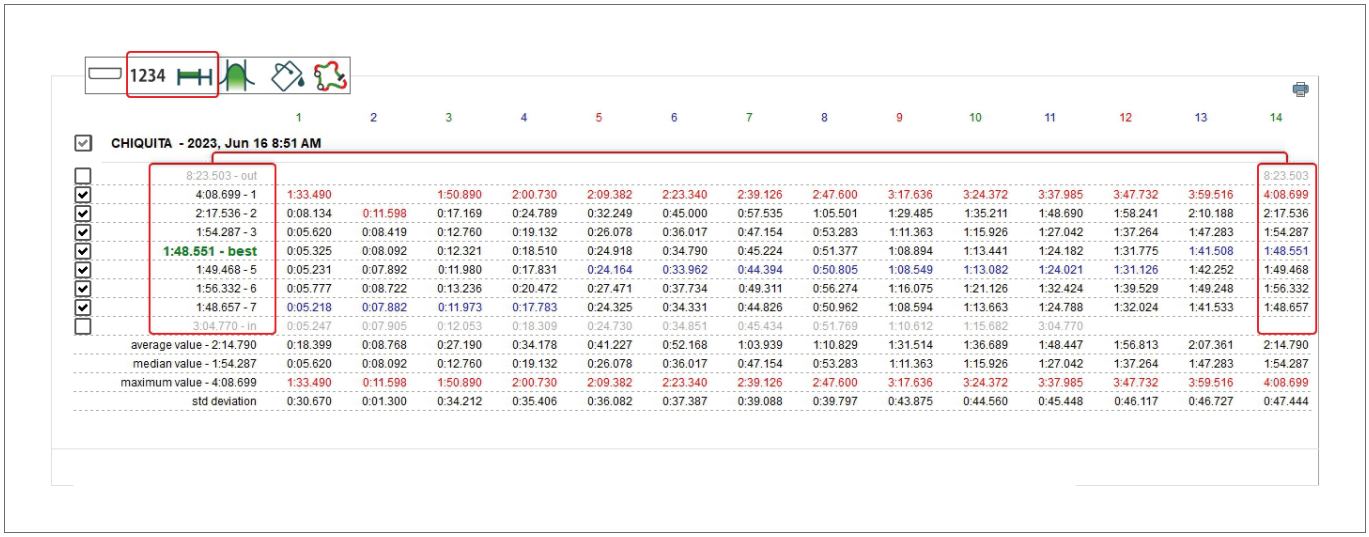


CHIQUITA - 2023, Jun 16 8:51 AM

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
8:23.503 - out														8:23.503
4:08.699 - 1	1:33.490		0:17.400	0:09.840	0:08.652	0:13.958	0:15.786	0:08.474	0:30.036	0:06.736	0:13.613	0:09.747	0:11.784	0:09.183
2:17.536 - 2	0:08.134	0:03.464	0:05.571	0:07.620	0:07.460	0:12.751	0:12.535	0:07.966	0:23.984	0:05.726	0:13.479	0:09.551	0:11.947	0:07.348
1:54.287 - 3	0:05.620	0:02.799	0:04.341	0:06.372	0:06.946	0:09.939	0:11.137	0:06.129	0:18.080	0:04.563	0:11.116	0:10.222	0:10.019	0:07.004
1:48.551 - best	0:05.325	0:02.767	0:04.229	0:06.189	0:06.408	0:09.872	0:10.434	0:06.153	0:17.517	0:04.547	0:10.741	0:07.593	0:09.733	0:07.043
1:49.468 - 5	0:05.231	0:02.661	0:04.088	0:05.851	0:06.333	0:09.798	0:10.432	0:06.411	0:17.744	0:04.533	0:10.939	0:07.105	0:11.126	0:07.216
1:56.332 - 6	0:05.777	0:02.945	0:04.514	0:07.236	0:06.999	0:10.263	0:11.577	0:06.963	0:19.801	0:05.051	0:11.298	0:07.105	0:09.719	0:07.084
1:48.657 - 7	0:05.218	0:02.664	0:04.091	0:05.810	0:06.542	0:10.006	0:10.495	0:06.136	0:17.632	0:05.069	0:11.125	0:07.236	0:09.509	0:07.124
3:04.770 - in	0:05.247	0:02.658	0:04.148	0:06.256	0:06.421	0:10.121	0:10.583	0:06.335	0:18.843	0:05.070	0:11.179			
average value - 2:15.202	0:18.399	0:02.883	0:06.319	0:06.988	0:07.049	0:10.941	0:11.771	0:06.890	0:20.685	0:05.175	0:11.759	0:08.366	0:10.548	0:07.429
median value - 1:52.592	0:05.620	0:02.767	0:04.341	0:06.372	0:06.946	0:10.006	0:11.137	0:06.411	0:18.080	0:05.051	0:11.125	0:07.593	0:10.019	0:07.124
best theoretical - 1:46.878	0:05.218	0:02.661	0:04.088	0:05.810	0:06.333	0:09.798	0:10.432	0:06.129	0:17.517	0:04.533	0:10.741	0:07.105	0:09.509	0:07.004
maximum value - 4:12.801	1:33.490	0:03.464	0:17.400	0:09.840	0:08.652	0:13.958	0:15.786	0:08.474	0:30.036	0:06.736	0:13.613	0:10.222	0:11.947	0:09.183
std deviation	0:30.670	0:00.277	0:04.549	0:01.325	0:00.749	0:01.566	0:01.787	0:00.894	0:04.374	0:00.751	0:01.142	0:01.299	0:00.966	0:00.724
best rolling - 1:47.721	0:05.231	0:02.661	0:04.088	0:05.851	0:06.333	0:09.798	0:10.432	0:06.153	0:17.517	0:04.547	0:10.741	0:07.593	0:09.733	0:07.043

9.4 – Absolute cumulative mode

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

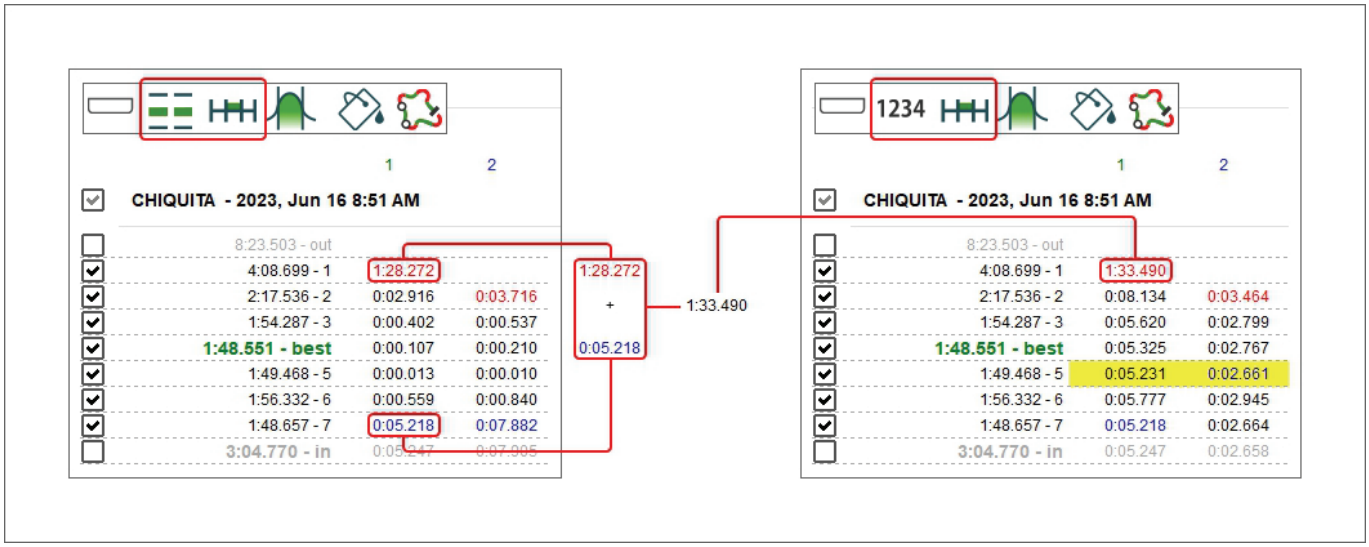


CHIQUITA - 2023, Jun 16 8:51 AM

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
8:23.503 - out														8:23.503
4:08.699 - 1	1:33.490		1:50.890	2:00.730	2:09.382	2:23.340	2:39.126	2:47.600	3:17.636	3:24.372	3:37.985	3:47.732	3:59.516	4:08.699
2:17.536 - 2	0:08.134	0:11.598	0:17.169	0:24.789	0:32.249	0:45.000	0:57.535	1:05.501	1:29.485	1:35.211	1:48.690	1:58.241	2:10.188	2:17.536
1:54.287 - 3	0:05.620	0:08.419	0:12.760	0:19.132	0:26.078	0:36.017	0:47.154	0:53.283	1:11.363	1:15.926	1:27.042	1:37.264	1:47.283	1:54.287
1:48.551 - best	0:05.325	0:08.092	0:12.321	0:18.510	0:24.918	0:34.790	0:45.224	0:51.377	1:08.894	1:13.441	1:24.182	1:31.775	1:41.508	1:48.551
1:49.468 - 5	0:05.231	0:07.892	0:11.980	0:17.831	0:24.164	0:33.962	0:44.394	0:50.805	1:08.549	1:13.082	1:24.021	1:31.126	1:42.252	1:49.468
1:56.332 - 6	0:05.777	0:08.722	0:13.236	0:20.472	0:27.471	0:37.734	0:49.311	0:56.274	1:16.075	1:21.126	1:32.424	1:39.529	1:49.248	1:56.332
1:48.657 - 7	0:05.218	0:07.882	0:11.973	0:17.783	0:24.325	0:34.331	0:44.826	0:50.962	1:08.594	1:13.663	1:24.788	1:32.024	1:41.533	1:48.657
3:04.770 - in	0:05.247	0:07.905	0:12.053	0:18.309	0:24.730	0:34.851	0:45.434	0:51.769	1:10.612	1:15.682	3:04.770			
average value - 2:14.790	0:18.399	0:08.768	0:27.190	0:34.178	0:41.227	0:52.168	1:03.939	1:10.829	1:31.514	1:36.689	1:48.447	1:56.813	2:07.361	2:14.790
median value - 1:54.287	0:05.620	0:08.092	0:12.760	0:19.132	0:26.078	0:36.017	0:47.154	0:53.283	1:11.363	1:15.926	1:27.042	1:37.264	1:47.283	1:54.287
maximum value - 4:08.699	1:33.490	0:11.598	1:50.890	2:00.730	2:09.382	2:23.340	2:39.126	2:47.600	3:17.636	3:24.372	3:37.985	3:47.732	3:59.516	4:08.699
std deviation	0:30.670	0:01.300	0:34.212	0:35.406	0:36.082	0:37.387	0:39.088	0:39.797	0:43.875	0:44.560	0:45.448	0:46.117	0:46.727	0:47.444

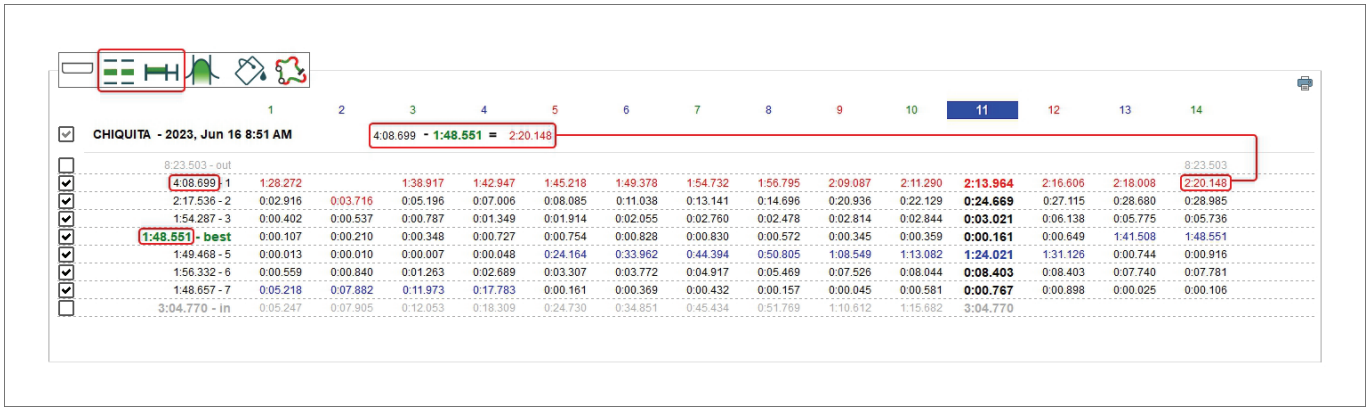
9.5 – Split time difference vs best split overall fractional mode

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 split time of the current split is in red; adding it to the best time of this split you recorded in the session you have the split time of the current split.



9.6 – Refer to best split cumulative mode

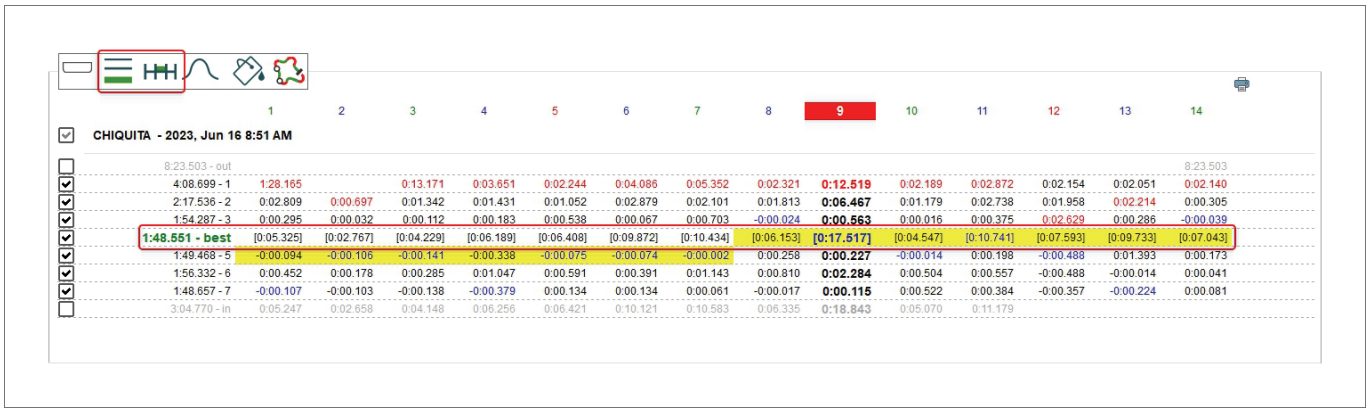
The difference between the current split time and the time reached at the current split in the best lap. Split times are added and the last split of the current lap shows the difference between the current lap time and the best lap time.



	1	2	3	4	5	6	7	8	9	10	11	12	13	14
CHIQUITA - 2023, Jun 16 8:51 AM			4:08.699 - 1:48.551 = 2:20.148											
8:23.503 - out														8:23.503
4:08.699 - 1	1:28.272		1:38.917	1:42.947	1:45.218	1:49.378	1:54.732	1:56.795	2:09.087	2:11.290	**2:13.964**	2:16.606	2:18.008	2:20.148
2:17.536 - 2	0:02.916	0:03.716	0:05.196	0:07.006	0:08.085	0:11.038	0:13.141	0:14.696	0:20.936	0:22.129	**0:24.669**	0:27.115	0:28.680	0:28.985
1:54.287 - 3	0:00.402	0:00.537	0:00.787	0:01.349	0:01.914	0:02.055	0:02.760	0:02.478	0:02.814	0:02.844	**0:03.021**	0:06.138	0:05.775	0:05.736
1:48.551 - best	0:00.107	0:00.210	0:00.348	0:00.727	0:00.754	0:00.828	0:00.830	0:00.572	0:00.345	0:00.359	**0:00.161**	0:00.649	1:41.508	1:48.551
1:49.468 - 5	0:00.013	0:00.010	0:00.007	0:00.048	0:24.164	0:33.962	0:44.394	0:50.805	1:08.549	1:13.082	**1:24.021**	1:31.126	0:00.744	0:00.916
1:56.332 - 6	0:00.559	0:00.840	0:01.263	0:02.689	0:03.307	0:03.772	0:04.917	0:05.469	0:07.526	0:08.044	**0:08.403**	0:08.403	0:07.740	0:07.781
1:48.657 - 7	0:05.218	0:07.882	0:11.973	0:17.783	0:00.161	0:00.369	0:00.432	0:00.157	0:00.045	0:00.581	**0:00.767**	0:00.898	0:00.025	0:00.106
3:04.770 - in	0:05.247	0:07.905	0:12.053	0:18.309	0:24.730	0:34.851	0:45.434	0:51.769	1:10.612	1:15.682	3:04.770			

9.7 – Refer to best lap fractional mode

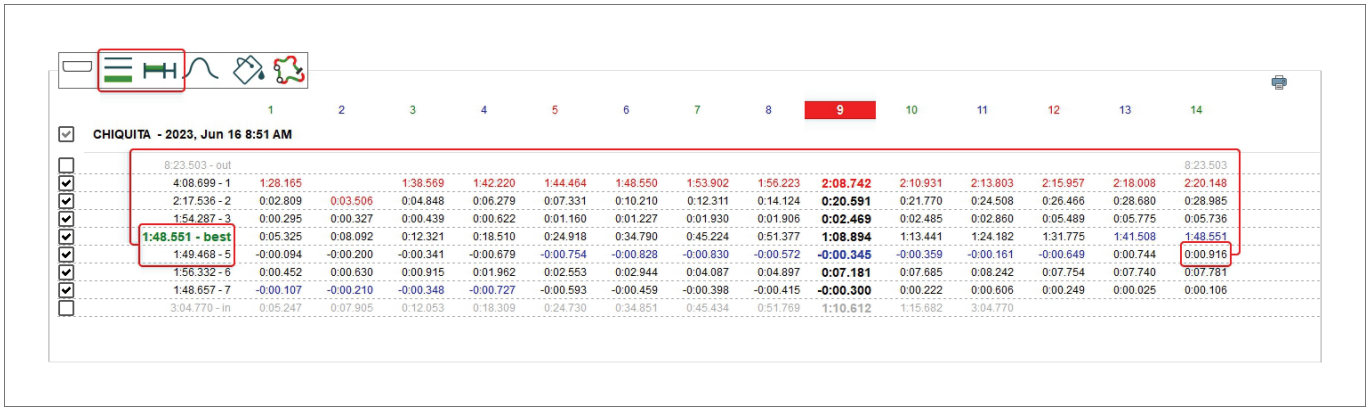
It shows the difference between the current split time and the time of the same split in best lap. Best lap time splits are shown in a square parenthesis on the related row (highlighted in the image below).



	1	2	3	4	5	6	7	8	9	10	11	12	13	14
CHIQUITA - 2023, Jun 16 8:51 AM														
8:23.503 - out														8:23.503
4:08.699 - 1	1:28.165		0:13.171	0:03.651	0:02.244	0:04.086	0:05.352	0:02.321	**0:12.519**	0:02.189	0:02.872	0:02.154	0:02.051	0:02.140
2:17.536 - 2	0:02.809	0:00.697	0:01.342	0:01.431	0:01.052	0:02.879	0:02.101	0:01.813	**0:06.467**	0:01.179	0:02.738	0:01.958	0:02.214	0:00.305
1:54.287 - 3	0:00.295	0:00.032	0:00.112	0:00.183	0:00.538	0:00.067	0:00.703	-0:00.024	**0:00.563**	0:00.016	0:00.375	0:02.629	0:00.286	-0:00.039
1:48.551 - best	[0:05.325]	[0:02.767]	[0:04.229]	[0:06.189]	[0:06.408]	[0:09.872]	[0:10.434]	[0:06.153]	[0:17.517]	[0:04.547]	[0:10.741]	[0:07.593]	[0:09.733]	[0:07.043]
1:49.468 - 5	-0:00.094	-0:00.106	-0:00.141	-0:00.338	-0:00.075	-0:00.074	-0:00.002	0:00.258	**0:00.227**	-0:00.014	0:00.198	-0:00.488	0:01.393	0:00.173
1:56.332 - 6	0:00.452	0:00.178	0:00.285	0:01.047	0:00.591	0:00.391	0:01.143	0:00.810	**0:02.284**	0:00.504	0:00.557	-0:00.488	-0:00.014	0:00.041
1:48.657 - 7	-0:00.107	-0:00.103	-0:00.138	-0:00.379	0:00.134	0:00.134	0:00.061	-0:00.017	**0:00.115**	0:00.522	0:00.384	-0:00.357	-0:00.224	0:00.081
3:04.770 - in	0:05.247	0:02.658	0:04.148	0:06.256	0:06.421	0:10.121	0:10.583	0:06.335	**0:18.843**	0:05.070	0:11.179			

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.

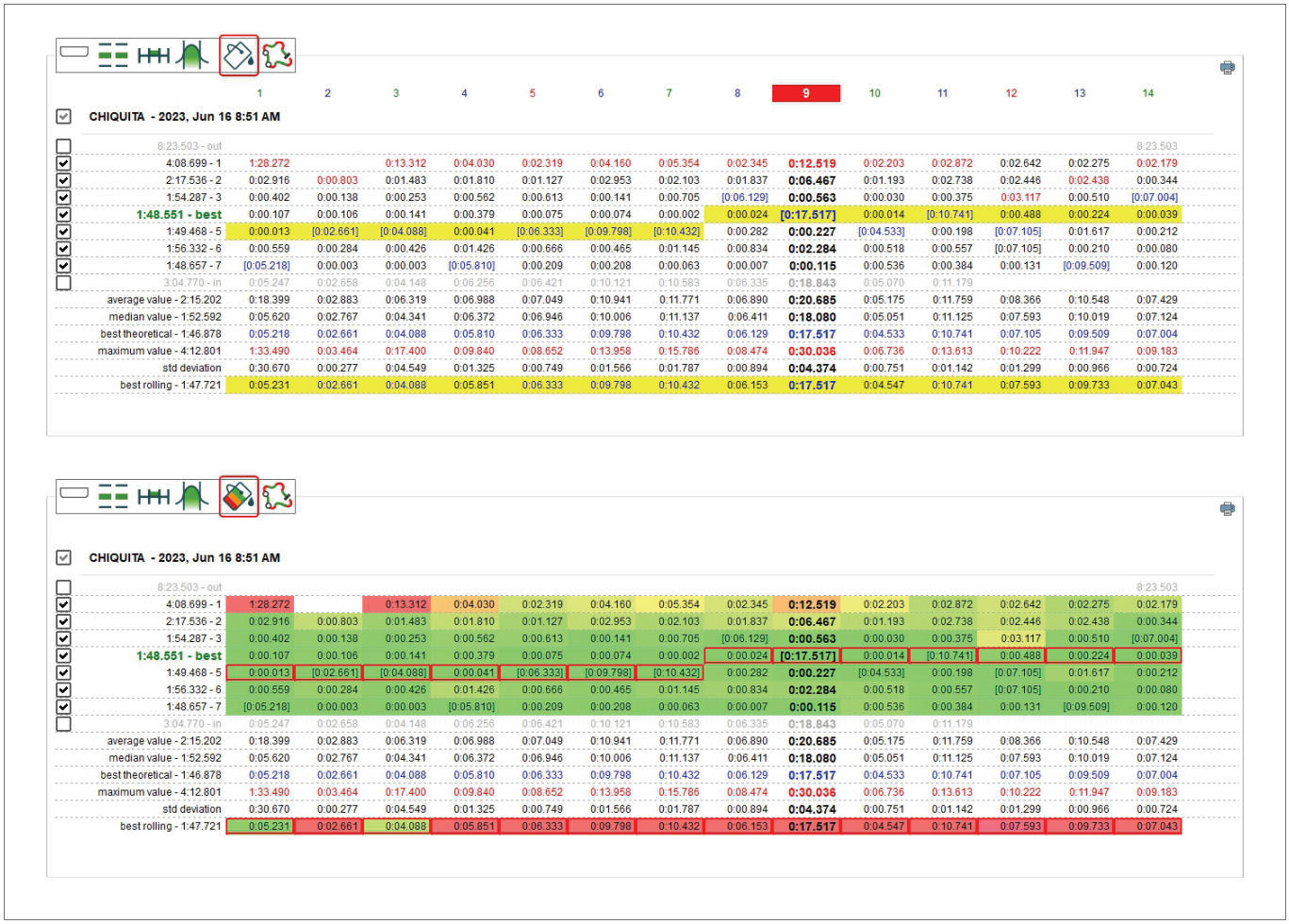


CHIQUITA - 2023, Jun 16 8:51 AM

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
8:23.503 - out														8:23.503
4:08.699 - 1	1:28.165		1:38.569	1:42.220	1:44.464	1:48.550	1:53.902	1:56.223	**2:08.742**	2:10.931	2:13.803	2:15.957	2:18.008	2:20.148
2:17.536 - 2	0:02.809	0:03.506	0:04.848	0:06.279	0:07.331	0:10.210	0:12.311	0:14.124	**0:20.591**	0:21.770	0:24.508	0:26.466	0:28.680	0:28.985
1:54.287 - 3	0:00.295	0:00.327	0:00.439	0:00.622	0:01.160	0:01.227	0:01.930	0:01.906	**0:02.469**	0:02.485	0:02.860	0:05.489	0:05.775	0:05.736
1:48.551 - best	0:05.325	0:08.092	0:12.321	0:18.510	0:24.918	0:34.790	0:45.224	0:51.377	**1:08.894**	1:13.441	1:24.182	1:31.775	1:41.508	1:48.551
1:49.468 - 5	-0:00.094	-0:00.200	-0:00.341	-0:00.679	-0:00.754	-0:00.828	-0:00.830	-0:00.572	**-0:00.345**	-0:00.359	-0:00.161	-0:00.649	0:00.744	0:00.916
1:56.332 - 6	0:00.452	0:00.630	0:00.915	0:01.962	0:02.553	0:02.944	0:04.087	0:04.897	**0:07.181**	0:07.685	0:08.242	0:07.754	0:07.740	0:07.781
1:48.657 - 7	-0:00.107	-0:00.210	-0:00.348	-0:00.727	-0:00.593	-0:00.459	-0:00.398	-0:00.415	**-0:00.300**	0:00.222	0:00.606	0:00.249	0:00.025	0:00.106
3:04.770 - in	0:05.247	0:07.905	0:12.053	0:18.309	0:24.730	0:34.851	0:45.434	0:51.769	**1:10.612**	1:15.682	3:04.770			

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 and best rolling is highlighted with red squares (bottom image below).



CHIQUITA - 2023, Jun 16 8:51 AM

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
8:23.503 - out														8:23.503
4:08.699 - 1	1:28.272		0:13.312	0:04.030	0:02.319	0:04.160	0:05.354	0:02.345	**0:12.519**	0:02.203	0:02.872	0:02.642	0:02.275	0:02.179
2:17.536 - 2	0:02.916	0:00.803	0:01.483	0:01.810	0:01.127	0:02.953	0:02.103	0:01.837	**0:06.467**	0:01.193	0:02.738	0:02.446	0:02.438	0:00.344
1:54.287 - 3	0:00.402	0:00.138	0:00.253	0:00.562	0:00.613	0:00.141	0:00.705	[0:06.129]	**0:00.563**	0:00.030	0:00.375	0:03.117	0:00.510	[0:07.004]
1:48.551 - best	0:00.107	0:00.106	0:00.141	0:00.379	0:00.075	0:00.074	0:00.002	0:00.024	**[0:17.517]**	0:00.014	[0:10.741]	0:00.488	0:00.224	0:00.039
1:49.468 - 5	0:00.013	[0:02.661]	[0:04.088]	0:00.041	[0:06.333]	[0:09.798]	[0:10.432]	0:00.282	**0:00.227**	[0:04.533]	0:00.198	[0:07.105]	0:01.617	0:00.212
1:56.332 - 6	0:00.559	0:00.284	0:00.426	0:01.426	0:00.666	0:00.465	0:01.145	0:00.834	**0:02.284**	0:00.518	0:00.557	[0:07.105]	0:00.210	0:00.080
1:48.657 - 7	[0:05.218]	0:00.003	0:00.003	[0:05.810]	0:00.209	0:00.208	0:00.063	0:00.007	**0:00.115**	0:00.536	0:00.384	0:00.131	[0:09.509]	0:00.120
3:04.770 - in	0:05.247	0:02.658	0:04.148	0:06.256	0:06.421	0:10.121	0:10.583	0:06.335	**0:18.843**	0:05.070	0:11.179			
average value - 2:15.202	0:18.399	0:02.883	0:06.319	0:06.988	0:07.049	0:10.941	0:11.771	0:06.890	**0:20.685**	0:05.175	0:11.759	0:08.366	0:10.548	0:07.429
median value - 1:52.592	0:05.620	0:02.767	0:04.341	0:06.372	0:06.946	0:10.006	0:11.137	0:06.411	**0:18.080**	0:05.051	0:11.125	0:07.593	0:10.019	0:07.124
best theoretical - 1:46.878	0:05.218	0:02.661	0:04.088	0:05.810	0:06.333	0:09.798	0:10.432	0:06.129	**0:17.517**	0:04.533	0:10.741	0:07.105	0:09.509	0:07.004
maximum value - 4:12.801	1:33.490	0:03.464	0:17.400	0:09.840	0:08.652	0:13.958	0:15.786	0:08.474	**0:30.036**	0:06.736	0:13.613	0:10.222	0:11.947	0:09.183
std deviation	0:30.670	0:00.277	0:04.549	0:01.325	0:00.749	0:01.566	0:01.787	0:00.894	**0:04.374**	0:00.751	0:01.142	0:01.299	0:00.966	0:00.724
best rolling - 1:47.721	0:05.231	0:02.661	0:04.088	0:05.851	0:06.333	0:09.798	0:10.432	0:06.153	**0:17.517**	0:04.547	0:10.741	0:07.593	0:09.733	0:07.043

CHIQUITA - 2023, Jun 16 8:51 AM

8:23.503 - out														8:23.503
4:08.699 - 1	1:28.272		0:13.312	0:04.030	0:02.319	0:04.160	0:05.354	0:02.345	**0:12.519**	0:02.203	0:02.872	0:02.642	0:02.275	0:02.179
2:17.536 - 2	0:02.916	0:00.803	0:01.483	0:01.810	0:01.127	0:02.953	0:02.103	0:01.837	**0:06.467**	0:01.193	0:02.738	0:02.446	0:02.438	0:00.344
1:54.287 - 3	0:00.402	0:00.138	0:00.253	0:00.562	0:00.613	0:00.141	0:00.705	[0:06.129]	**0:00.563**	0:00.030	0:00.375	0:03.117	0:00.510	[0:07.004]
1:48.551 - best	0:00.107	0:00.106	0:00.141	0:00.379	0:00.075	0:00.074	0:00.002	0:00.024	**[0:17.517]**	0:00.014	[0:10.741]	0:00.488	0:00.224	0:00.039
1:49.468 - 5	0:00.013	[0:02.661]	[0:04.088]	0:00.041	[0:06.333]	[0:09.798]	[0:10.432]	0:00.282	**0:00.227**	[0:04.533]	0:00.198	[0:07.105]	0:01.617	0:00.212
1:56.332 - 6	0:00.559	0:00.284	0:00.426	0:01.426	0:00.666	0:00.465	0:01.145	0:00.834	**0:02.284**	0:00.518	0:00.557	[0:07.105]	0:00.210	0:00.080
1:48.657 - 7	[0:05.218]	0:00.003	0:00.003	[0:05.810]	0:00.209	0:00.208	0:00.063	0:00.007	**0:00.115**	0:00.536	0:00.384	0:00.131	[0:09.509]	0:00.120
3:04.770 - in	0:05.247	0:02.658	0:04.148	0:06.256	0:06.421	0:10.121	0:10.583	0:06.335	**0:18.843**	0:05.070	0:11.179			
average value - 2:15.202	0:18.399	0:02.883	0:06.319	0:06.988	0:07.049	0:10.941	0:11.771	0:06.890	**0:20.685**	0:05.175	0:11.759	0:08.366	0:10.548	0:07.429
median value - 1:52.592	0:05.620	0:02.767	0:04.341	0:06.372	0:06.946	0:10.006	0:11.137	0:06.411	**0:18.080**	0:05.051	0:11.125	0:07.593	0:10.019	0:07.124
best theoretical - 1:46.878	0:05.218	0:02.661	0:04.088	0:05.810	0:06.333	0:09.798	0:10.432	0:06.129	**0:17.517**	0:04.533	0:10.741	0:07.105	0:09.509	0:07.004
maximum value - 4:12.801	1:33.490	0:03.464	0:17.400	0:09.840	0:08.652	0:13.958	0:15.786	0:08.474	**0:30.036**	0:06.736	0:13.613	0:10.222	0:11.947	0:09.183
std deviation	0:30.670	0:00.277	0:04.549	0:01.325	0:00.749	0:01.566	0:01.787	0:00.894	**0:04.374**	0:00.751	0:01.142	0:01.299	0:00.966	0:00.724
best rolling - 1:47.721	0:05.231	0:02.661	0:04.088	0:05.851	0:06.333	0:09.798	0:10.432	0:06.153	**0:17.517**	0:04.547	0:10.741	0:07.593	0:09.733	0:07.043

9.10 – Settings dialog window

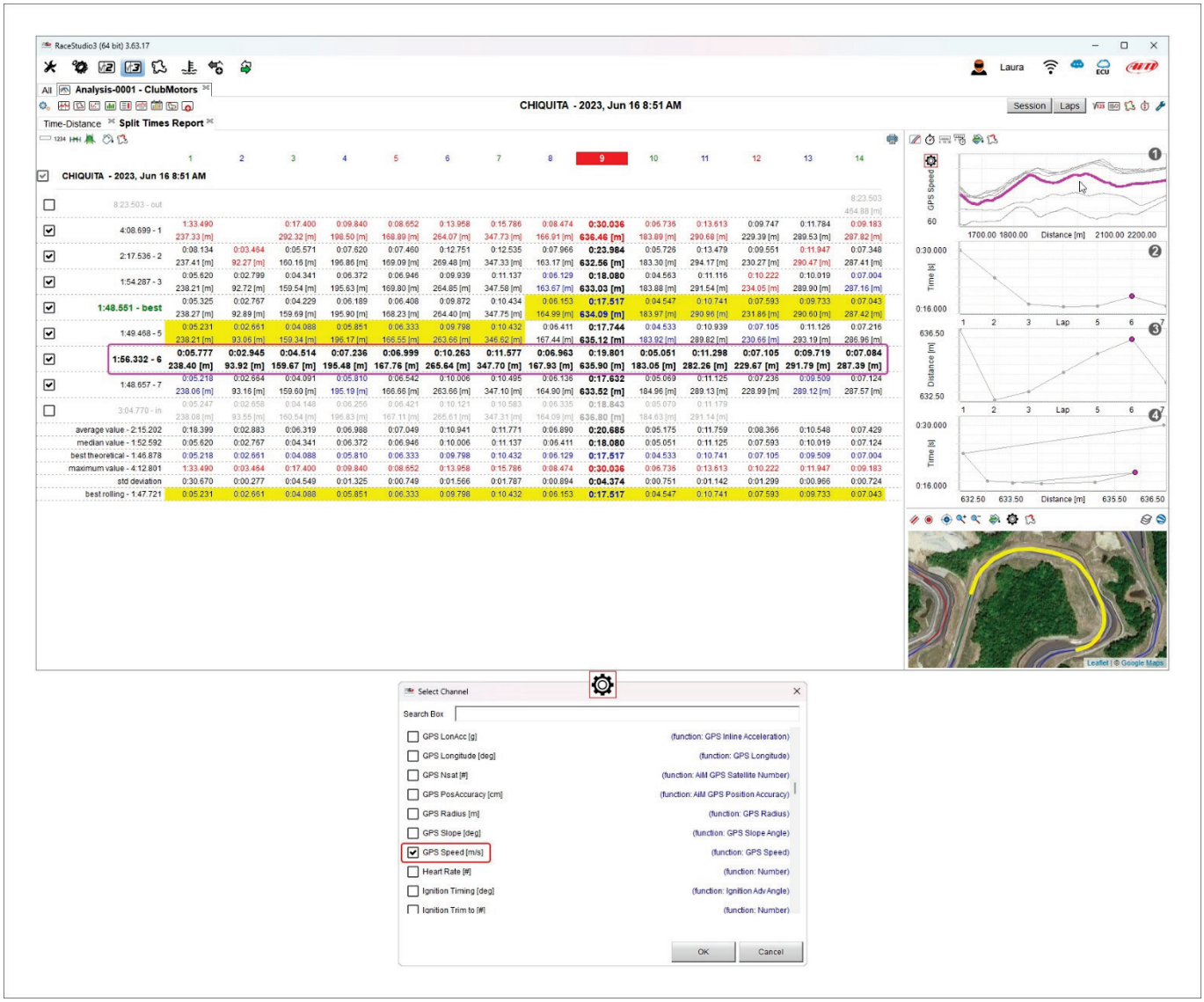
Right clicking on the central table "Setting" dialog window is prompted. It allows to perform the same operations performed through the top left keyboard as well as to hide the table when the Space Bar is pressed enabling the related checkbox.

Enabling the devoted checkbox in the first box (highlighted with green background in the image below) the length of each split is shown below each split time (cells highlighted with green background)

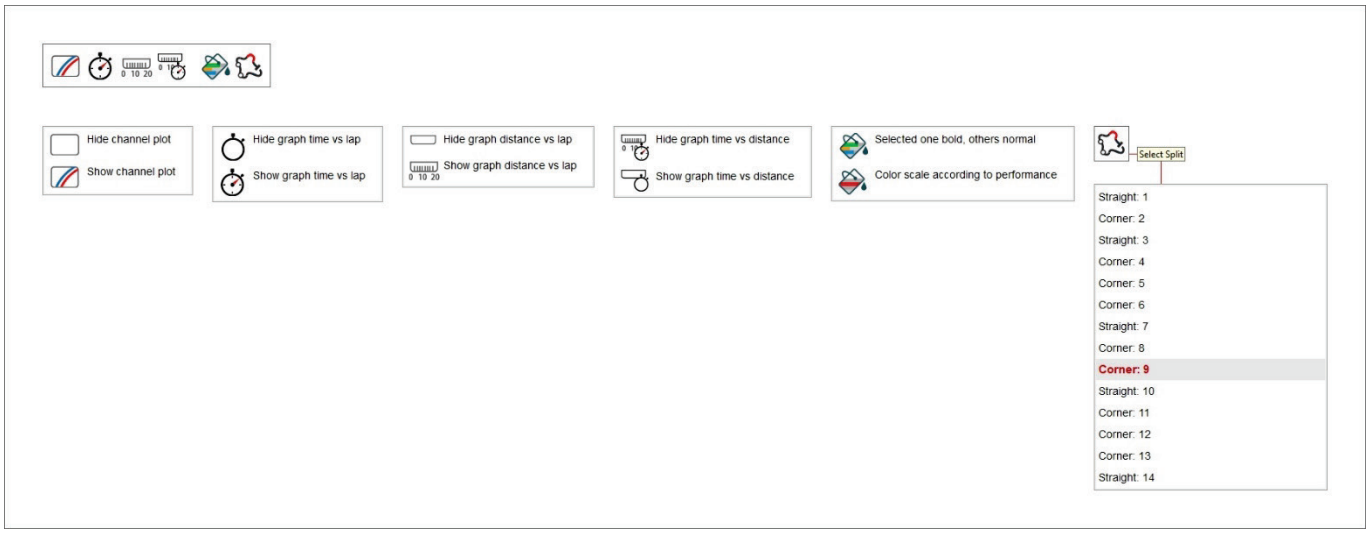
9.11 – Split graphs

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**)



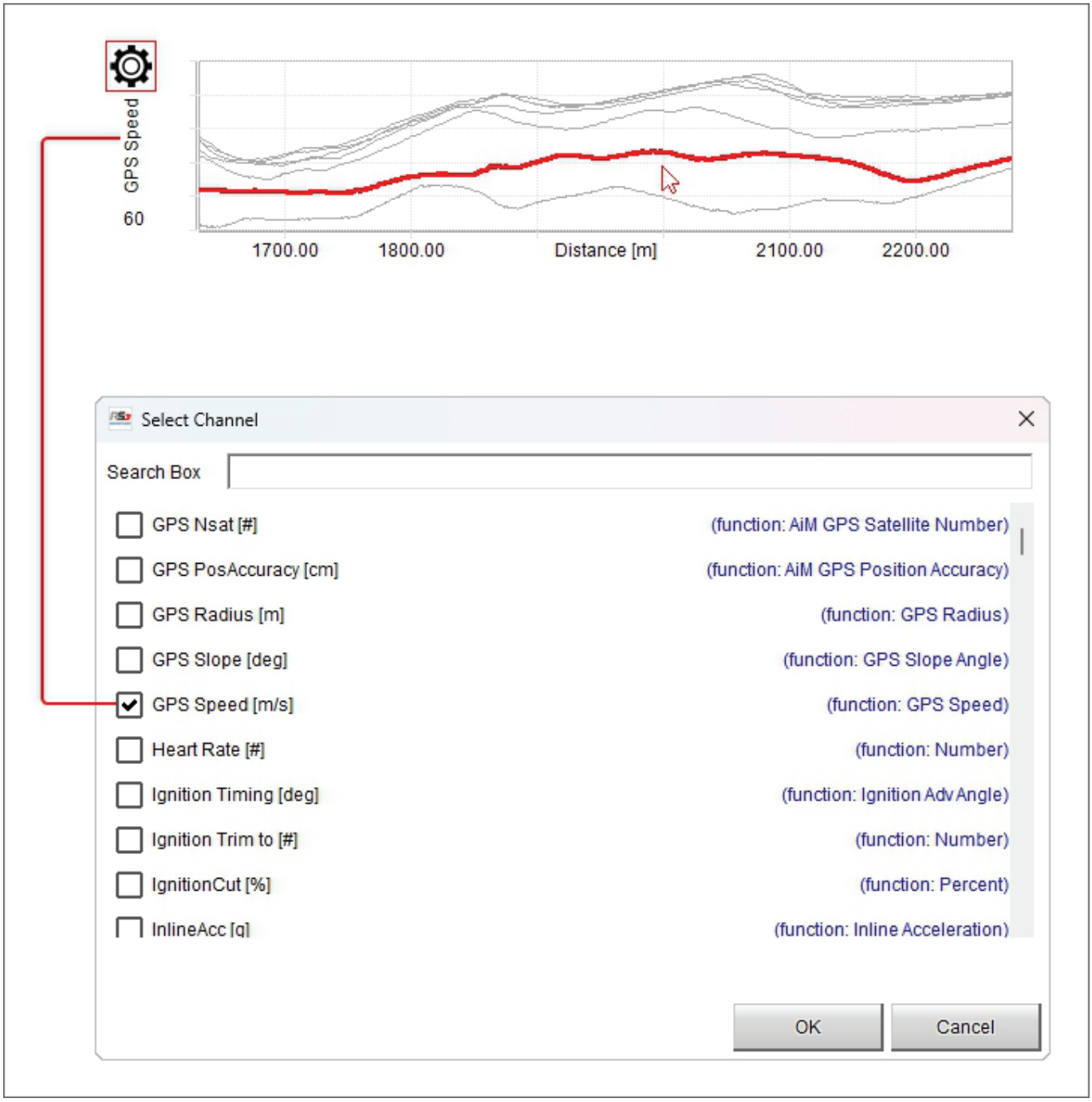
Each graph can be shown/hidden using the keyboard top left of the graphs.



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 search for the channel you want to set on the ordinate axis and press "OK"; default channel is GPS Speed
- mousing over the graph the split you are mousing over becomes bold in the central table and vice-versa.

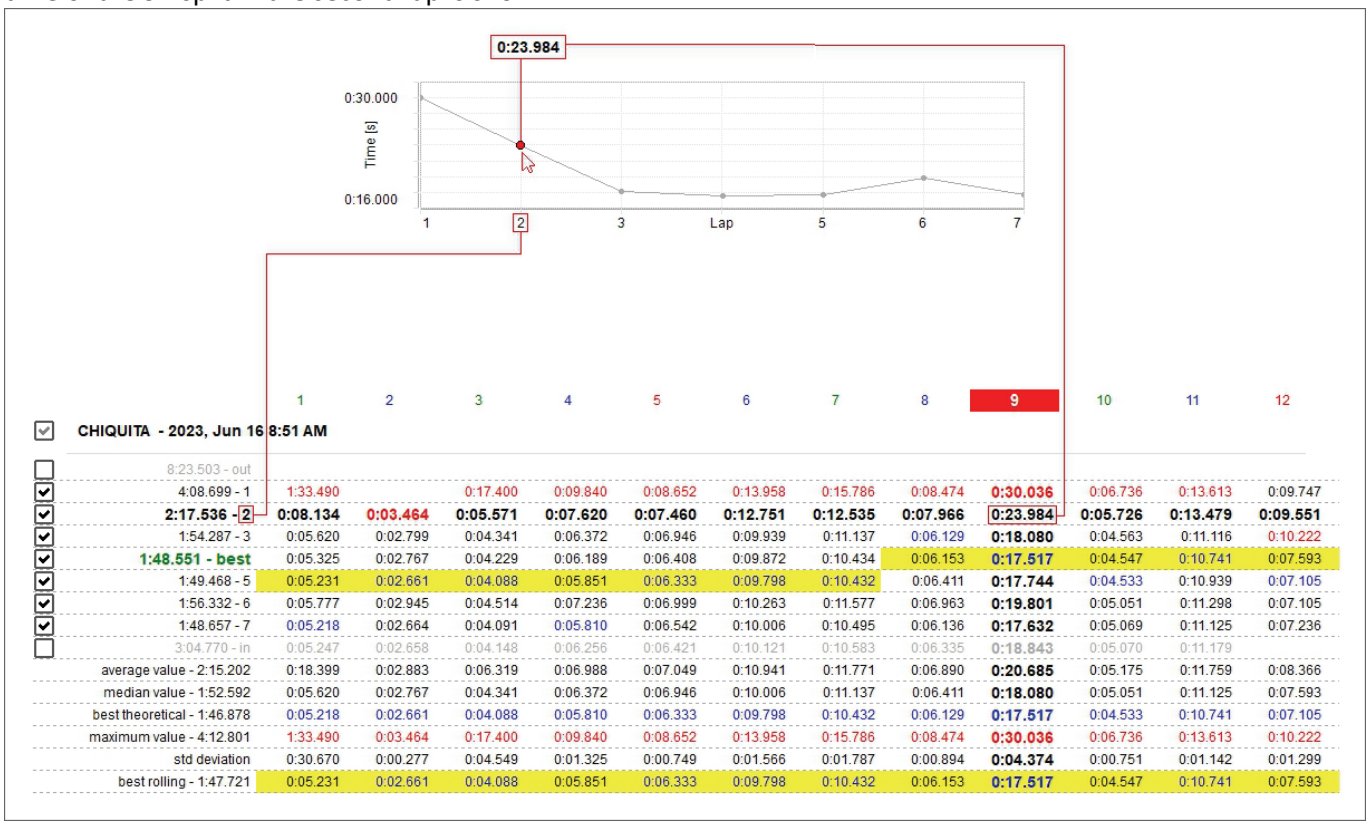


9.11.2 – Time/Lap (number) graph

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

mousing over the selected split it becomes bold in the central table and vice versa; in the example below split time of the 9th split in the second lap is shown.

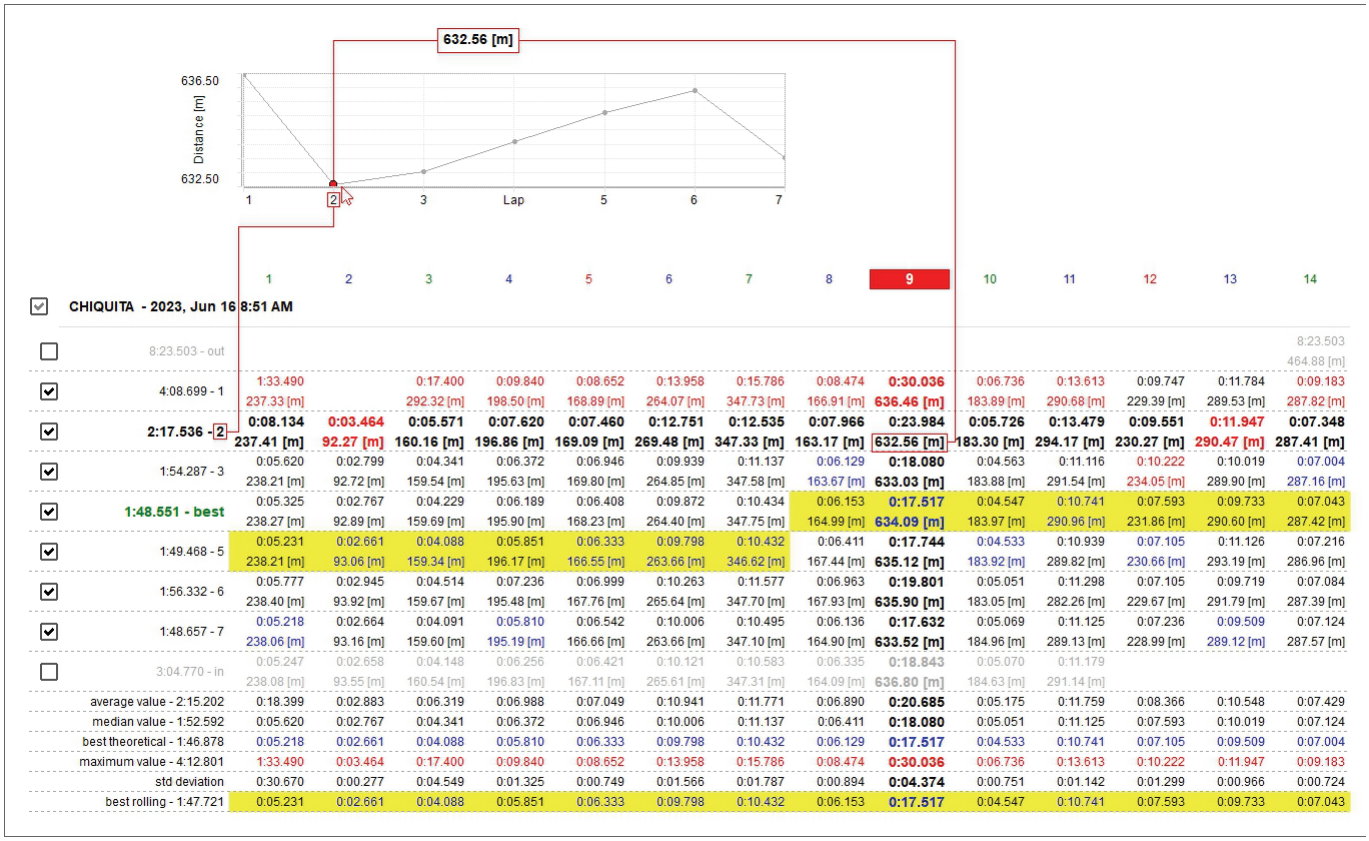


	1	2	3	4	5	6	7	8	9	10	11	12
CHIQUITA - 2023, Jun 16 8:51 AM												
8:23.503 - out												
4:08.699 - 1	1:33.490		0:17.400	0:09.840	0:08.652	0:13.958	0:15.786	0:08.474	**0:30.036**	0:06.736	0:13.613	0:09.747
2:17.536 - 2	**0:08.134**	**0:03.464**	**0:05.571**	**0:07.620**	**0:07.460**	**0:12.751**	**0:12.535**	**0:07.966**	0:23.984	**0:05.726**	**0:13.479**	**0:09.551**
1:54.287 - 3	0:05.620	0:02.799	0:04.341	0:06.372	0:06.946	0:09.939	0:11.137	0:06.129	**0:18.080**	0:04.563	0:11.116	0:10.222
1:48.551 - best	0:05.325	0:02.767	0:04.229	0:06.189	0:06.408	0:09.872	0:10.434	0:06.153	**0:17.517**	0:04.547	0:10.741	0:07.593
1:49.468 - 5	0:05.231	0:02.661	0:04.088	0:05.851	0:06.333	0:09.798	0:10.432	0:06.411	**0:17.744**	0:04.533	0:10.939	0:07.105
1:56.332 - 6	0:05.777	0:02.945	0:04.514	0:07.236	0:06.999	0:10.263	0:11.577	0:06.963	**0:19.801**	0:05.051	0:11.298	0:07.105
1:48.657 - 7	0:05.218	0:02.664	0:04.091	0:05.810	0:06.542	0:10.006	0:10.495	0:06.136	**0:17.632**	0:05.069	0:11.125	0:07.236
3:04.770 - in	0:05.247	0:02.658	0:04.148	0:06.256	0:06.421	0:10.121	0:10.583	0:06.335	**0:18.843**	0:05.070	0:11.179	
average value - 2:15.202	0:18.399	0:02.883	0:06.319	0:06.988	0:07.049	0:10.941	0:11.771	0:06.890	**0:20.685**	0:05.175	0:11.759	0:08.366
median value - 1:52.592	0:05.620	0:02.767	0:04.341	0:06.372	0:06.946	0:10.006	0:11.137	0:06.411	**0:18.080**	0:05.051	0:11.125	0:07.593
best theoretical - 1:46.878	0:05.218	0:02.661	0:04.088	0:05.810	0:06.333	0:09.798	0:10.432	0:06.129	**0:17.517**	0:04.533	0:10.741	0:07.105
maximum value - 4:12.801	1:33.490	0:03.464	0:17.400	0:09.840	0:08.652	0:13.958	0:15.786	0:08.474	**0:30.036**	0:06.736	0:13.613	0:10.222
std deviation	0:30.670	0:00.277	0:04.549	0:01.325	0:00.749	0:01.566	0:01.787	0:00.894	**0:04.374**	0:00.751	0:01.142	0:01.299
best rolling - 1:47.721	0:05.231	0:02.661	0:04.088	0:05.851	0:06.333	0:09.798	0:10.432	0:06.153	**0:17.517**	0:04.547	0:10.741	0:07.593

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 9.2)



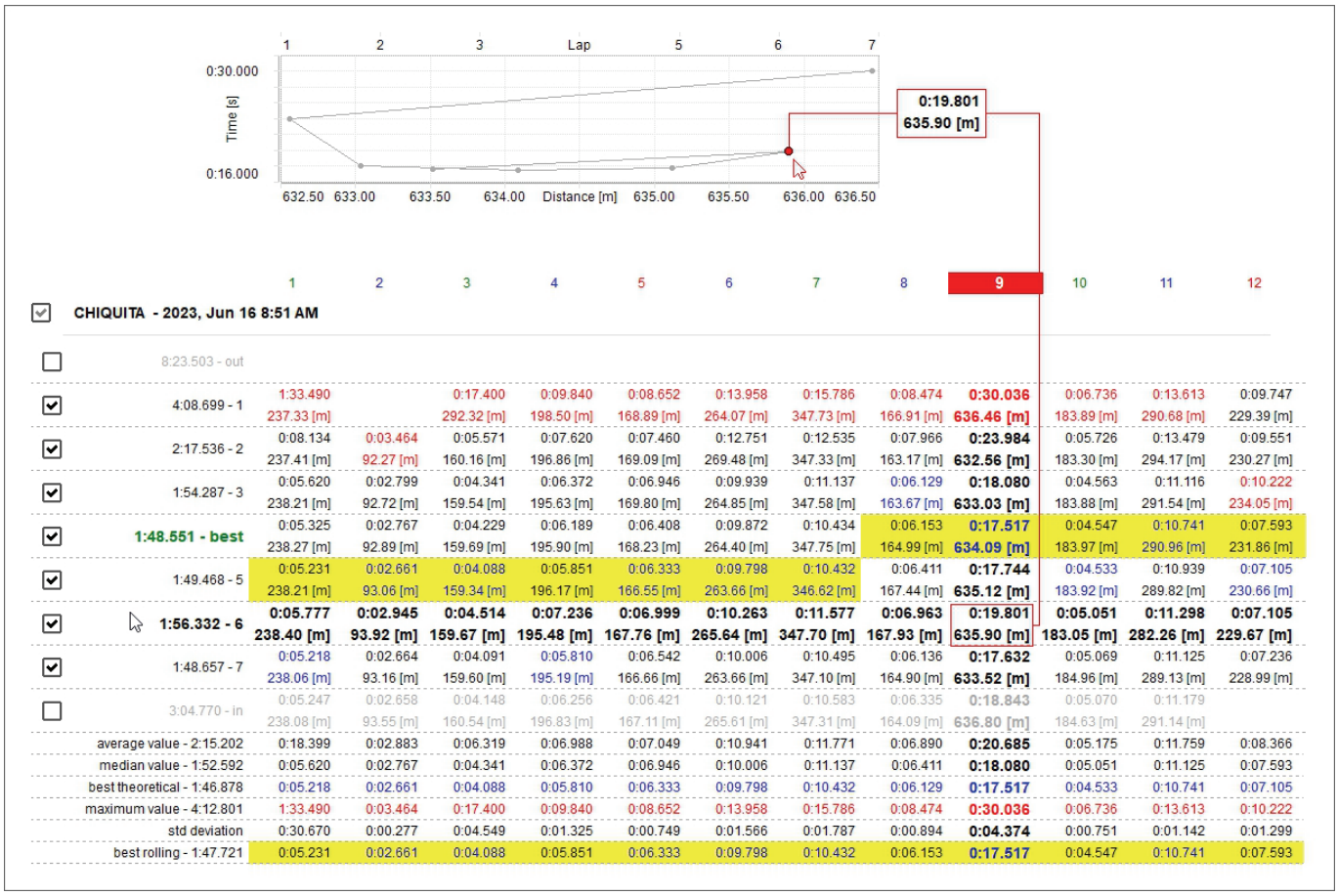
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
CHIQUITA - 2023, Jun 16 8:51 AM														
8:23.503 - out														8:23.503 464.88 [m]
4:08.699 - 1	1:33.490 237.33 [m]		0:17.400 292.32 [m]	0:09.840 198.50 [m]	0:08.652 168.89 [m]	0:13.958 264.07 [m]	0:15.786 347.73 [m]	0:08.474 166.91 [m]	**0:30.036** **636.46 [m]**	0:06.736 183.89 [m]	0:13.613 290.68 [m]	0:09.747 229.39 [m]	0:11.784 289.53 [m]	0:09.183 287.82 [m]
2:17.536 - 2	**0:08.134** **237.41 [m]**	**0:03.464** **92.27 [m]**	**0:05.571** **160.16 [m]**	**0:07.620** **196.86 [m]**	**0:07.460** **169.09 [m]**	**0:12.751** **269.48 [m]**	**0:12.535** **347.33 [m]**	**0:07.966** **163.17 [m]**	**0:23.984** **632.56 [m]**	**0:05.726** **183.30 [m]**	**0:13.479** **294.17 [m]**	**0:09.551** **230.27 [m]**	**0:11.947** **290.47 [m]**	**0:07.348** **287.41 [m]**
1:54.287 - 3	0:05.620 238.21 [m]	0:02.799 92.72 [m]	0:04.341 159.54 [m]	0:06.372 195.63 [m]	0:06.946 169.80 [m]	0:09.939 264.85 [m]	0:11.137 347.58 [m]	0:06.129 163.67 [m]	**0:18.080** **633.03 [m]**	0:04.563 183.88 [m]	0:11.116 291.54 [m]	0:10.222 234.05 [m]	0:10.019 289.90 [m]	0:07.004 287.16 [m]
1:48.551 - best	0:05.325 238.27 [m]	0:02.767 92.89 [m]	0:04.229 159.69 [m]	0:06.189 195.90 [m]	0:06.408 168.23 [m]	0:09.872 264.40 [m]	0:10.434 347.75 [m]	0:06.153 164.99 [m]	**0:17.517** **634.09 [m]**	0:04.547 183.97 [m]	0:10.741 290.96 [m]	0:07.593 231.86 [m]	0:09.733 290.60 [m]	0:07.043 287.42 [m]
1:49.468 - 5	0:05.231 238.21 [m]	0:02.661 93.06 [m]	0:04.088 159.34 [m]	0:05.851 196.17 [m]	0:06.333 166.55 [m]	0:09.798 263.66 [m]	0:10.432 346.62 [m]	0:06.411 167.44 [m]	**0:17.744** **635.12 [m]**	0:04.533 183.92 [m]	0:10.939 289.82 [m]	0:07.105 230.66 [m]	0:11.126 293.19 [m]	0:07.216 286.96 [m]
1:56.332 - 6	0:05.777 238.40 [m]	0:02.945 93.92 [m]	0:04.514 159.67 [m]	0:07.236 195.48 [m]	0:06.999 167.76 [m]	0:10.263 265.64 [m]	0:11.577 347.70 [m]	0:06.963 167.93 [m]	**0:19.801** **635.90 [m]**	0:05.051 183.05 [m]	0:11.298 282.26 [m]	0:07.105 229.67 [m]	0:09.719 291.79 [m]	0:07.084 287.39 [m]
1:48.657 - 7	0:05.218 238.06 [m]	0:02.664 93.16 [m]	0:04.091 159.60 [m]	0:05.810 195.19 [m]	0:06.542 166.66 [m]	0:10.006 263.66 [m]	0:10.495 347.10 [m]	0:06.136 164.90 [m]	**0:17.632** **633.52 [m]**	0:05.069 184.96 [m]	0:11.125 289.13 [m]	0:07.236 228.99 [m]	0:09.509 289.12 [m]	0:07.124 287.57 [m]
3:04.770 - in	0:05.247 238.08 [m]	0:02.658 93.55 [m]	0:04.148 160.54 [m]	0:06.256 196.83 [m]	0:06.421 167.11 [m]	0:10.121 265.61 [m]	0:10.583 347.31 [m]	0:06.335 164.09 [m]	**0:18.843** **636.80 [m]**	0:05.070 184.63 [m]	0:11.179 291.14 [m]			
average value - 2:15.202	0:18.399	0:02.883	0:06.319	0:06.988	0:07.049	0:10.941	0:11.771	0:06.890	**0:20.685**	0:05.175	0:11.759	0:08.366	0:10.548	0:07.429
median value - 1:52.592	0:05.620	0:02.767	0:04.341	0:06.372	0:06.946	0:10.006	0:11.137	0:06.411	**0:18.080**	0:05.051	0:11.125	0:07.593	0:10.019	0:07.124
best theoretical - 1:46.878	0:05.218	0:02.661	0:04.088	0:05.810	0:06.333	0:09.798	0:10.432	0:06.129	**0:17.517**	0:04.533	0:10.741	0:07.105	0:09.509	0:07.004
maximum value - 4:12.801	1:33.490	0:03.464	0:17.400	0:09.840	0:08.652	0:13.958	0:15.786	0:08.474	**0:30.036**	0:06.736	0:13.613	0:10.222	0:11.947	0:09.183
std deviation	0:30.670	0:00.277	0:04.549	0:01.325	0:00.749	0:01.566	0:01.787	0:00.894	**0:04.374**	0:00.751	0:01.142	0:01.299	0:00.966	0:00.724
best rolling - 1:47.721	0:05.231	0:02.661	0:04.088	0:05.851	0:06.333	0:09.798	0:10.432	0:06.153	**0:17.517**	0:04.547	0:10.741	0:07.593	0:09.733	0:07.043

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.



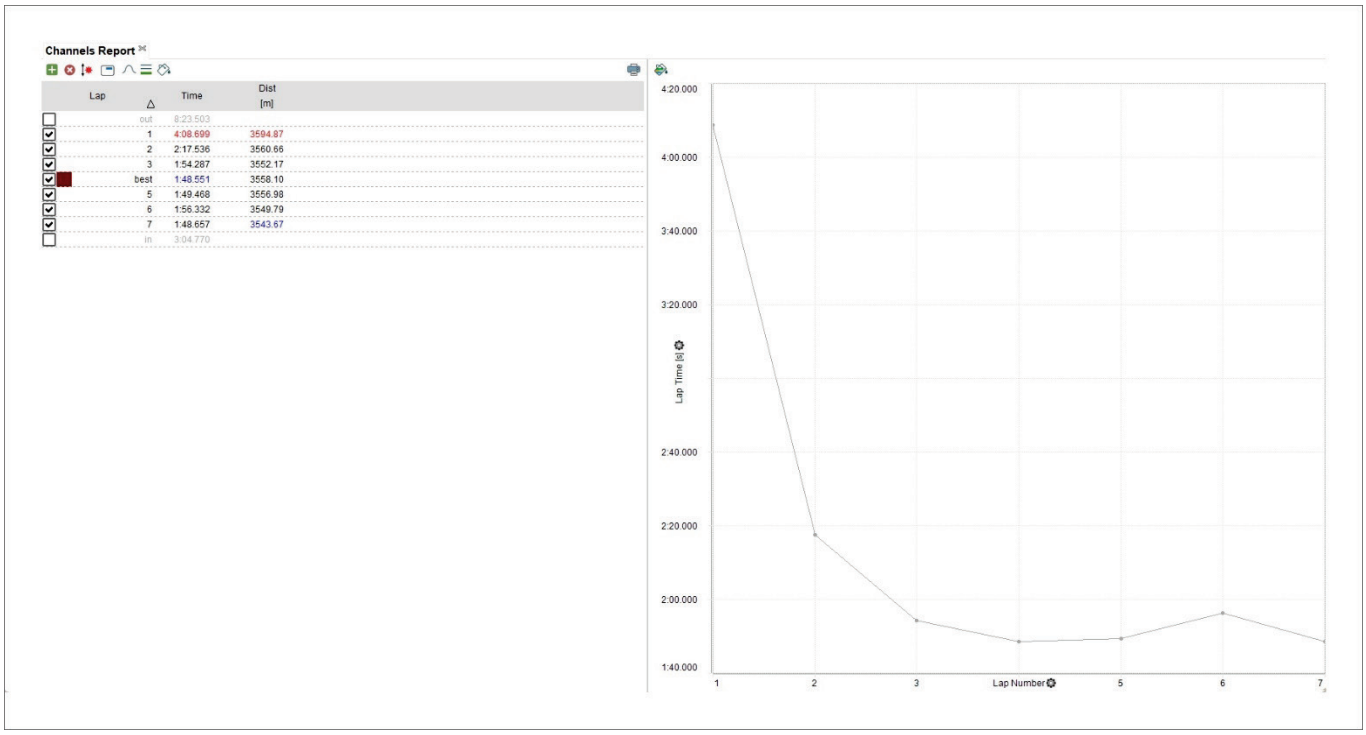
	1	2	3	4	5	6	7	8	9	10	11	12
CHIQUITA - 2023, Jun 16 8:51 AM												
8:23.503 - out												
4:08.699 - 1	1:33.490		0:17.400	0:09.840	0:08.652	0:13.958	0:15.786	0:08.474	**0:30.036**	0:06.736	0:13.613	0:09.747
	237.33 [m]		292.32 [m]	198.50 [m]	168.89 [m]	264.07 [m]	347.73 [m]	166.91 [m]	**636.46 [m]**	183.89 [m]	290.68 [m]	229.39 [m]
2:17.536 - 2	0:08.134	0:03.464	0:05.571	0:07.620	0:07.460	0:12.751	0:12.535	0:07.966	**0:23.984**	0:05.726	0:13.479	0:09.551
	237.41 [m]	92.27 [m]	160.16 [m]	196.86 [m]	169.09 [m]	269.48 [m]	347.33 [m]	163.17 [m]	**632.56 [m]**	183.30 [m]	294.17 [m]	230.27 [m]
1:54.287 - 3	0:05.620	0:02.799	0:04.341	0:06.372	0:06.946	0:09.939	0:11.137	0:06.129	**0:18.080**	0:04.563	0:11.116	0:10.222
	238.21 [m]	92.72 [m]	159.54 [m]	195.63 [m]	169.80 [m]	264.85 [m]	347.58 [m]	163.67 [m]	**633.03 [m]**	183.88 [m]	291.54 [m]	234.05 [m]
1:48.551 - best	0:05.325	0:02.767	0:04.229	0:06.189	0:06.408	0:09.872	0:10.434	0:06.153	**0:17.517**	0:04.547	0:10.741	0:07.593
	238.27 [m]	92.89 [m]	159.69 [m]	195.90 [m]	168.23 [m]	264.40 [m]	347.75 [m]	164.99 [m]	**634.09 [m]**	183.97 [m]	290.96 [m]	231.86 [m]
1:49.468 - 5	0:05.231	0:02.661	0:04.088	0:05.851	0:06.333	0:09.798	0:10.432	0:06.411	**0:17.744**	0:04.533	0:10.939	0:07.105
	238.21 [m]	93.06 [m]	159.34 [m]	196.17 [m]	166.55 [m]	263.66 [m]	346.62 [m]	167.44 [m]	**635.12 [m]**	183.92 [m]	289.82 [m]	230.66 [m]
1:56.332 - 6	**0:05.777**	**0:02.945**	**0:04.514**	**0:07.236**	**0:06.999**	**0:10.263**	**0:11.577**	**0:06.963**	0:19.801	**0:05.051**	**0:11.298**	**0:07.105**
	238.40 [m]	**93.92 [m]**	**159.67 [m]**	**195.48 [m]**	**167.76 [m]**	**265.64 [m]**	**347.70 [m]**	**167.93 [m]**	635.90 [m]	**183.05 [m]**	**282.26 [m]**	**229.67 [m]**
1:48.657 - 7	0:05.218	0:02.664	0:04.091	0:05.810	0:06.542	0:10.006	0:10.495	0:06.136	**0:17.632**	0:05.069	0:11.125	0:07.236
	238.06 [m]	93.16 [m]	159.60 [m]	195.19 [m]	166.66 [m]	263.66 [m]	347.10 [m]	164.90 [m]	**633.52 [m]**	184.96 [m]	289.13 [m]	228.99 [m]
3:04.770 - in	0:05.247	0:02.658	0:04.148	0:06.256	0:06.421	0:10.121	0:10.583	0:06.335	**0:18.843**	0:05.070	0:11.179	
	238.08 [m]	93.55 [m]	160.54 [m]	196.83 [m]	167.11 [m]	265.61 [m]	347.31 [m]	164.09 [m]	**636.80 [m]**	184.63 [m]	291.14 [m]	
average value - 2:15.202	0:18.399	0:02.883	0:06.319	0:06.988	0:07.049	0:10.941	0:11.771	0:06.890	**0:20.685**	0:05.175	0:11.759	0:08.366
median value - 1:52.592	0:05.620	0:02.767	0:04.341	0:06.372	0:06.946	0:10.006	0:11.137	0:06.411	**0:18.080**	0:05.051	0:11.125	0:07.593
best theoretical - 1:46.878	0:05.218	0:02.661	0:04.088	0:05.810	0:06.333	0:09.798	0:10.432	0:06.129	**0:17.517**	0:04.533	0:10.741	0:07.105
maximum value - 4:12.801	1:33.490	0:03.464	0:17.400	0:09.840	0:08.652	0:13.958	0:15.786	0:08.474	**0:30.036**	0:06.736	0:13.613	0:10.222
std deviation	0:30.670	0:00.277	0:04.549	0:01.325	0:00.749	0:01.566	0:01.787	0:00.894	**0:04.374**	0:00.751	0:01.142	0:01.299
best rolling - 1:47.721	0:05.231	0:02.661	0:04.088	0:05.851	0:06.333	0:09.798	0:10.432	0:06.153	**0:17.517**	0:04.547	0:10.741	0:07.593

10 – Channels Report layout

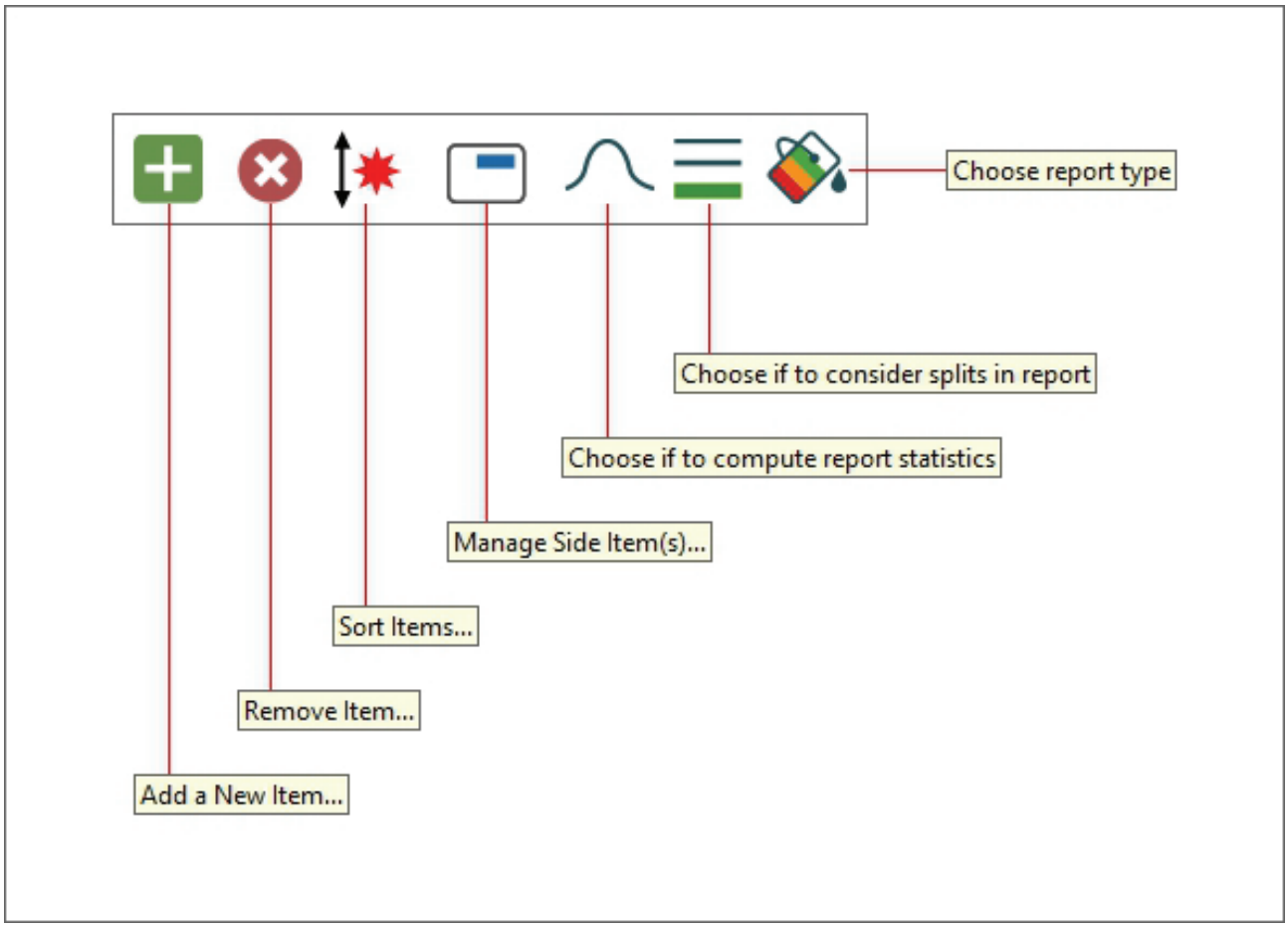
This layout gives a macro-representation of calculation made on the channels so to have a quick view on each channel. The layout is made up of two parts: the values table on the left (clicking on the header of each column data can be sorted increasingly/decreasingly) and the custom graph on the right.
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

Please note: to use such channels as temperature, pressure and so on you need to previously add them to the table on the left of the view (see paragraph 10.1 for further information)



Using the top left keyboard of "Channels report" view it is possible to perform different actions, as shown here below and explained in the following paragraphs.



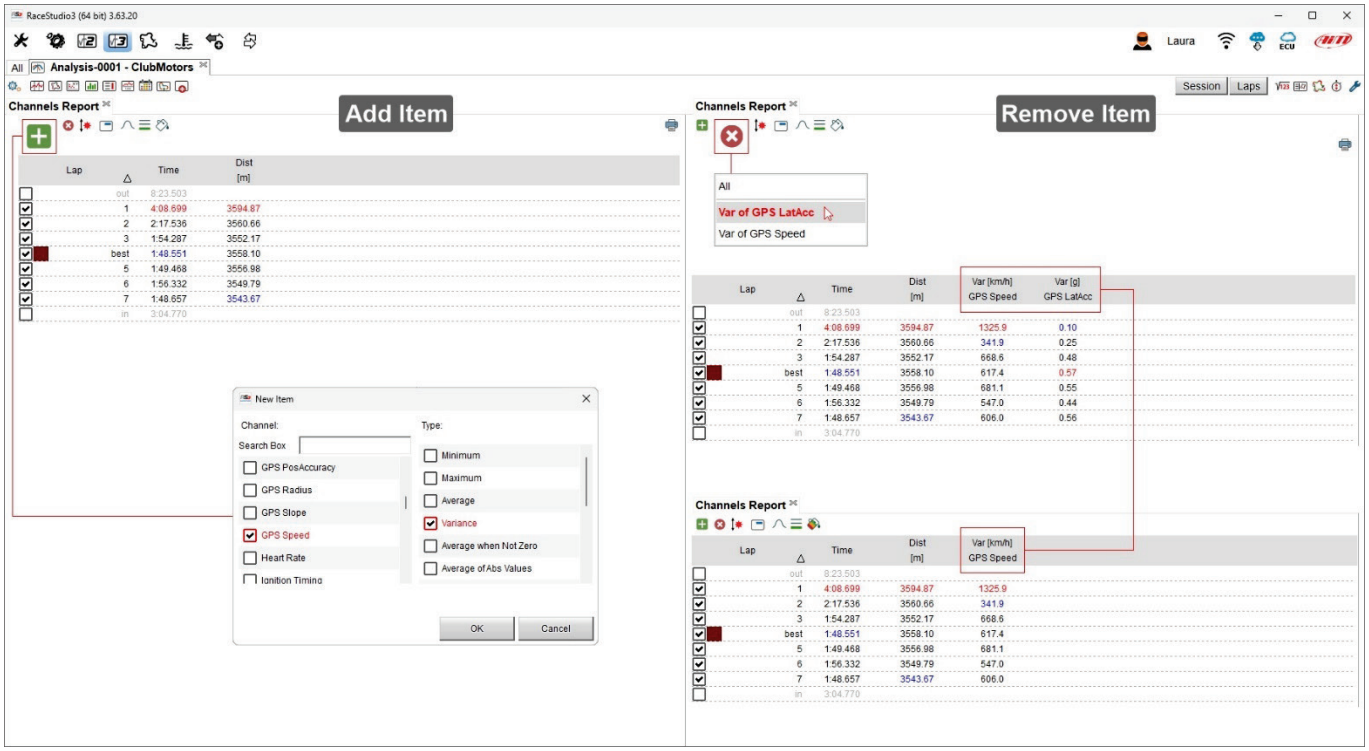
10.1 – Add/remove items in the left part of "Channels Report" view

Through these buttons it is possible to add/remove items (column) to/from the table placed left of "Channels report" view except for the first three columns from the left.
To "**Add**" an item:

- press the related icon (**+**)
- scroll the panel that is prompted or search for the channel
- select the item do add and its type (Max/Min/Average value, Variance, Average when not zero etc..)
- press "OK and the item is added. Repeat this operation for all the items to add

To "**Remove**" an item:

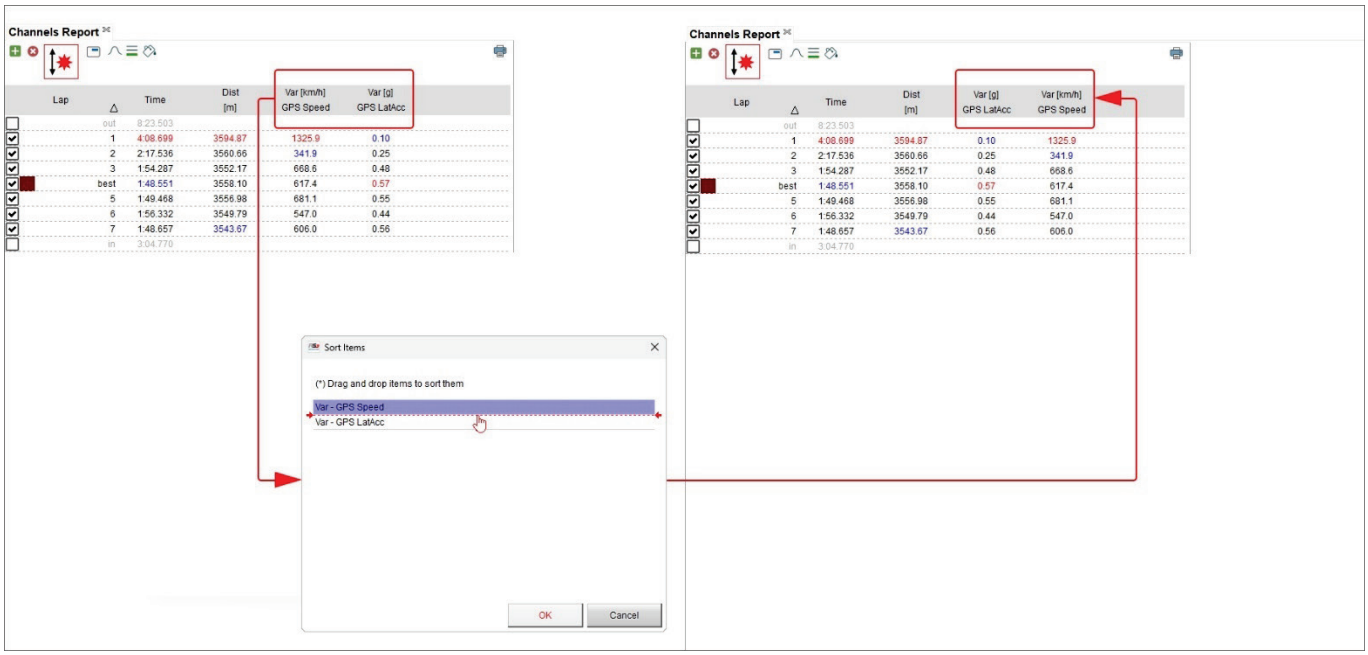
- press the related icon (**x**)
- a menu showing the items previously added Is prompted
- select the one to remove
- it will be removed.



10.2 – Sort items

Once added all the desired item it is possible to displace the related columns as preferred.

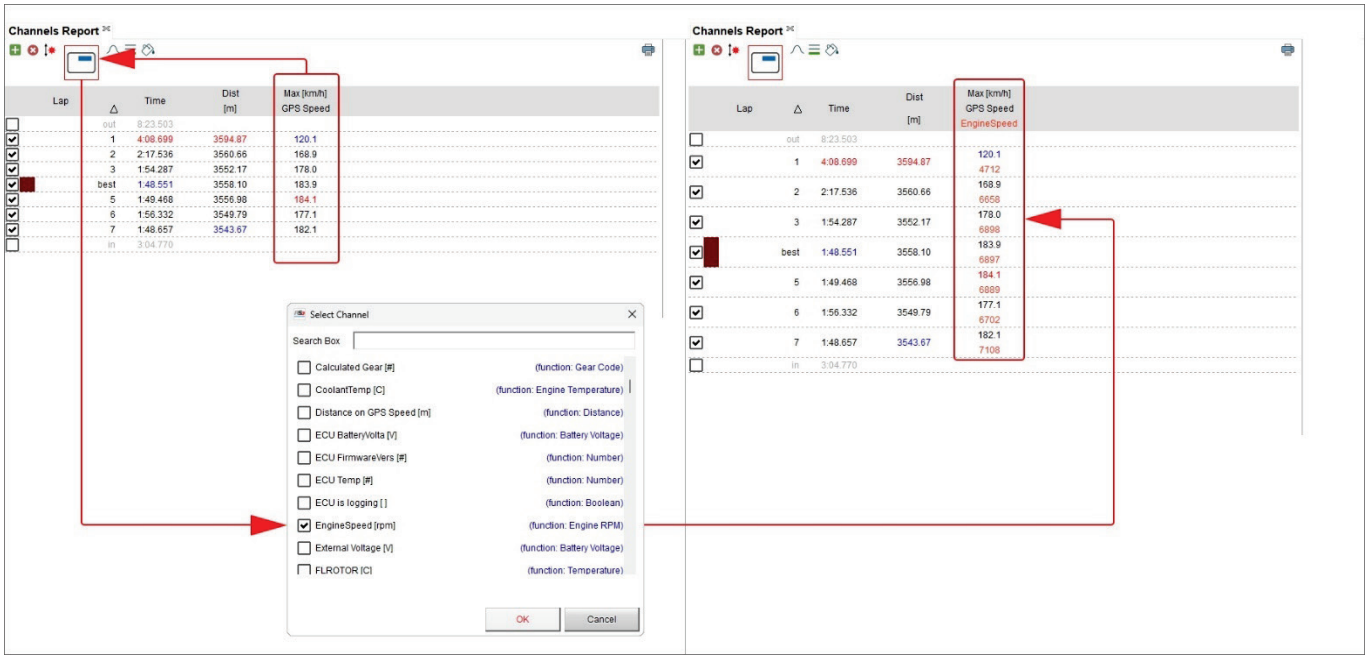
- press the related icon
- drag and drop the items as you wish
- press “OK”
- the columns are displaced



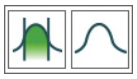
10.3 – Managing Side Items

Race Studio 3 Analysis allows the user to see the values of different channels in the same point assuming that both channels are shown as Max/Min Values. In the example below Max GPS Speed and RPM are shown. To do so:

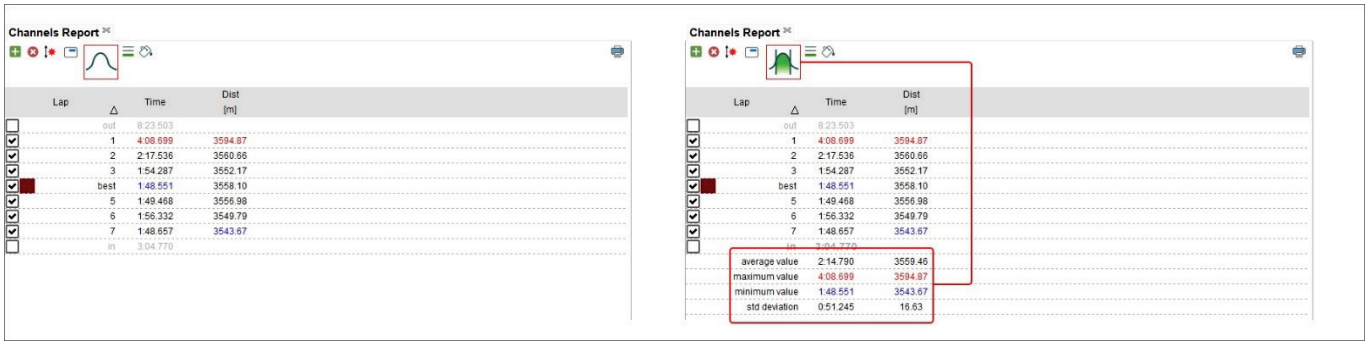
- add the first channel as explained in paragraph 10.1
- click “Side Items Icon” shown above
- select the second channel
- both channels are shown one below the other



10.4 – Show/Hide statistics

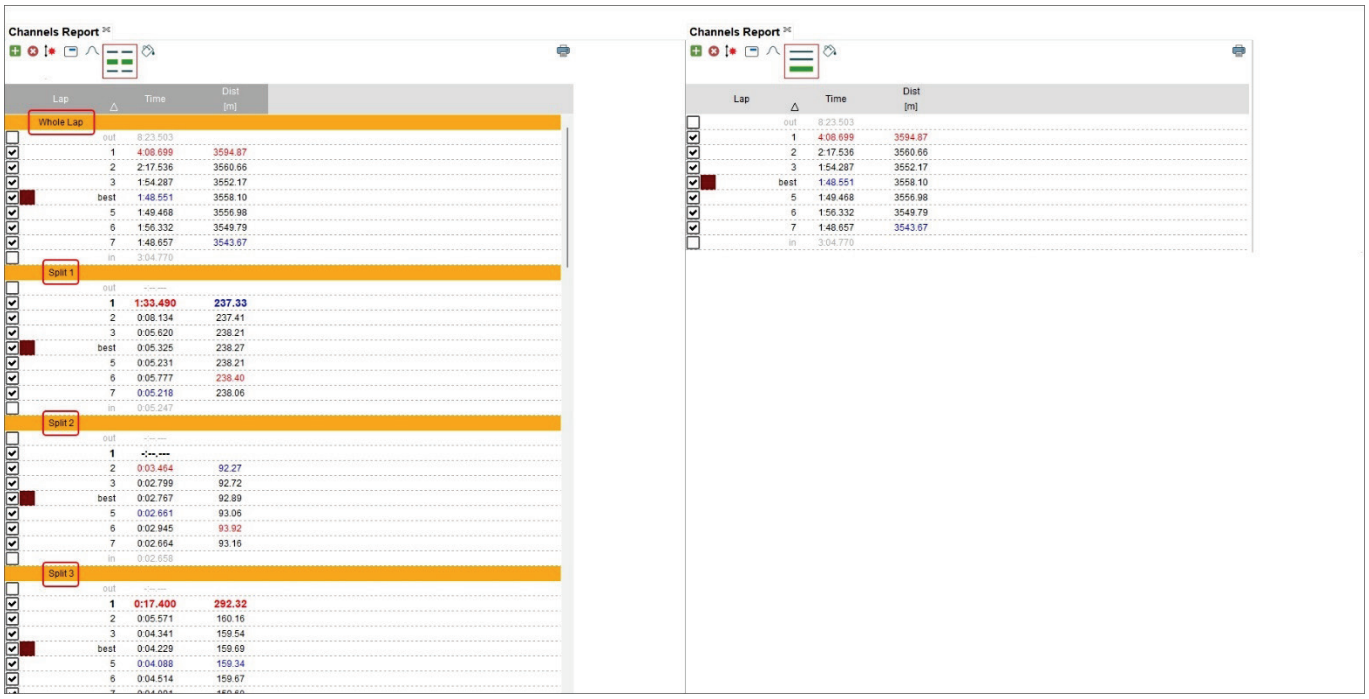


As for Time/Distance and Track split report Channels report too allow to show the statistics using the related buttons shown here above.



10.5 – Show/Hide splits in report

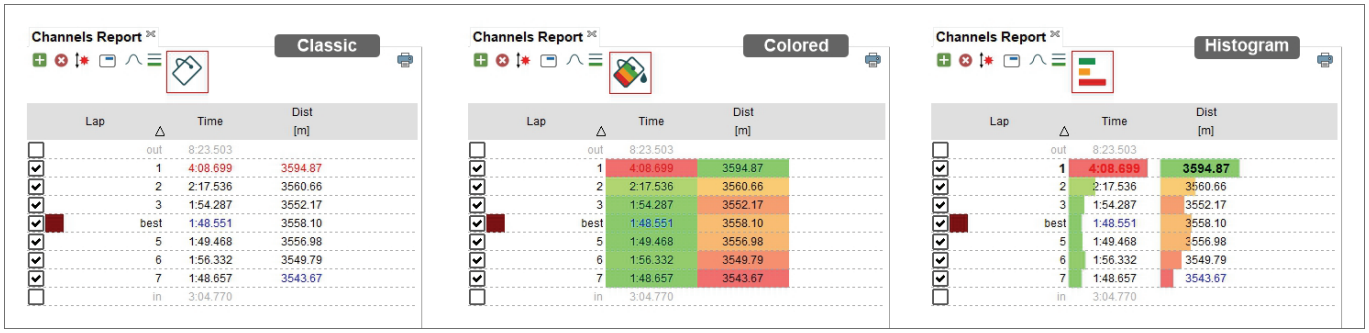
With reference to the image below, data can be shown with (left table) or without (right) splits. When showing the laps with splits data concerning the whole laps are on the coloured bar and all splits follows.



10.6 – Managing report type

Channels report table can be shown in different ways as shown here below. The visualization can be:

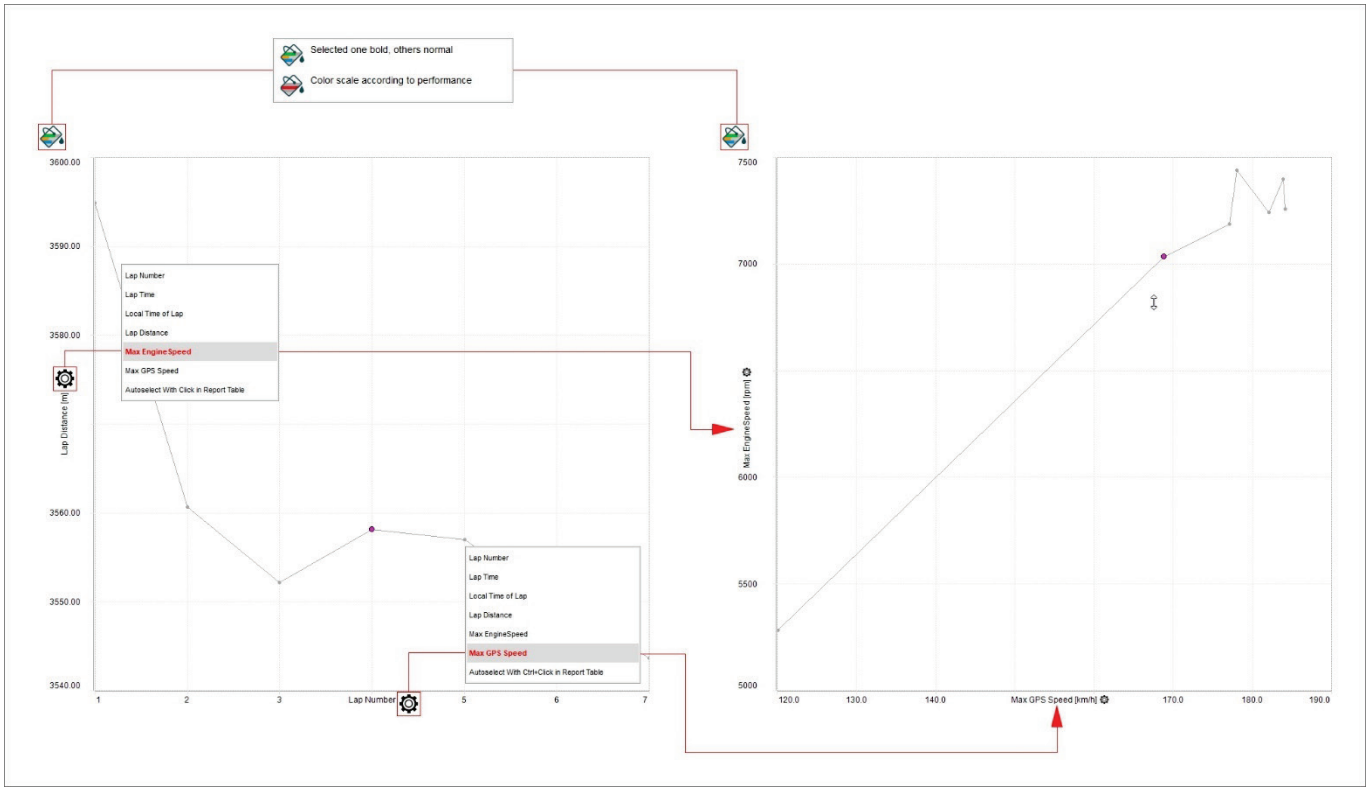
- Classic
- Coloured according to cell values: each cell is coloured according to its value from green to red where green stays for good performance and red for bad performance
- Histogram: allows to see at a glance the difference between the laps/splits



10.7 – The custom graph

Right of "Channels Report" layout is a "Custom" graph whose channels on the abscissa axis and on the ordinate axis can be changed according to the user preferences. To change the channel on the axes:

- click the setting icon of the axis to change
- a selection menu is prompted
- select the channel to be shown
- click out the panel



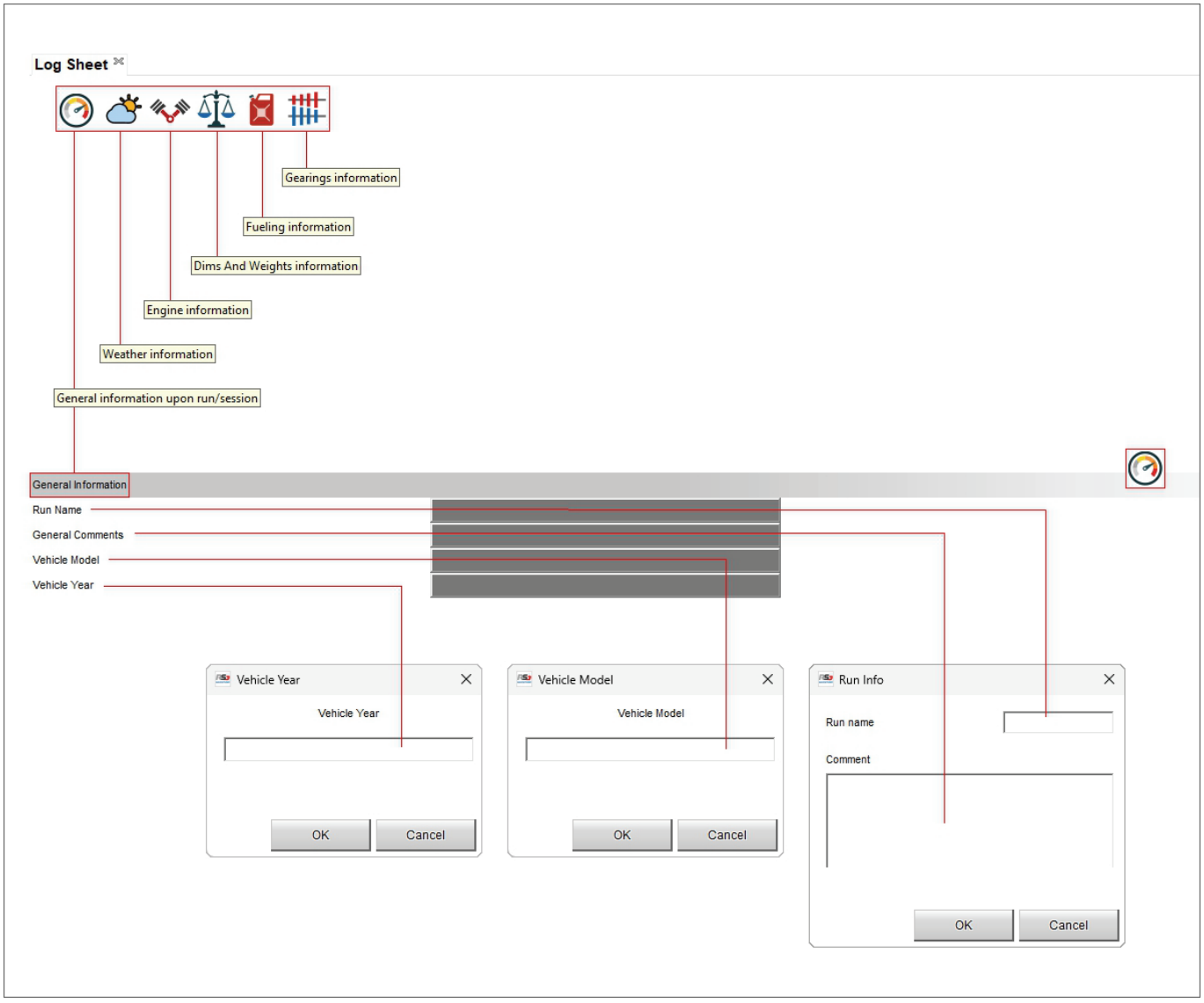
11 – Log sheet layout

Log sheet view allows to fill in and set different information concerning the run/session, the weather and the vehicle as shown below.

11.1 – Log sheet general information

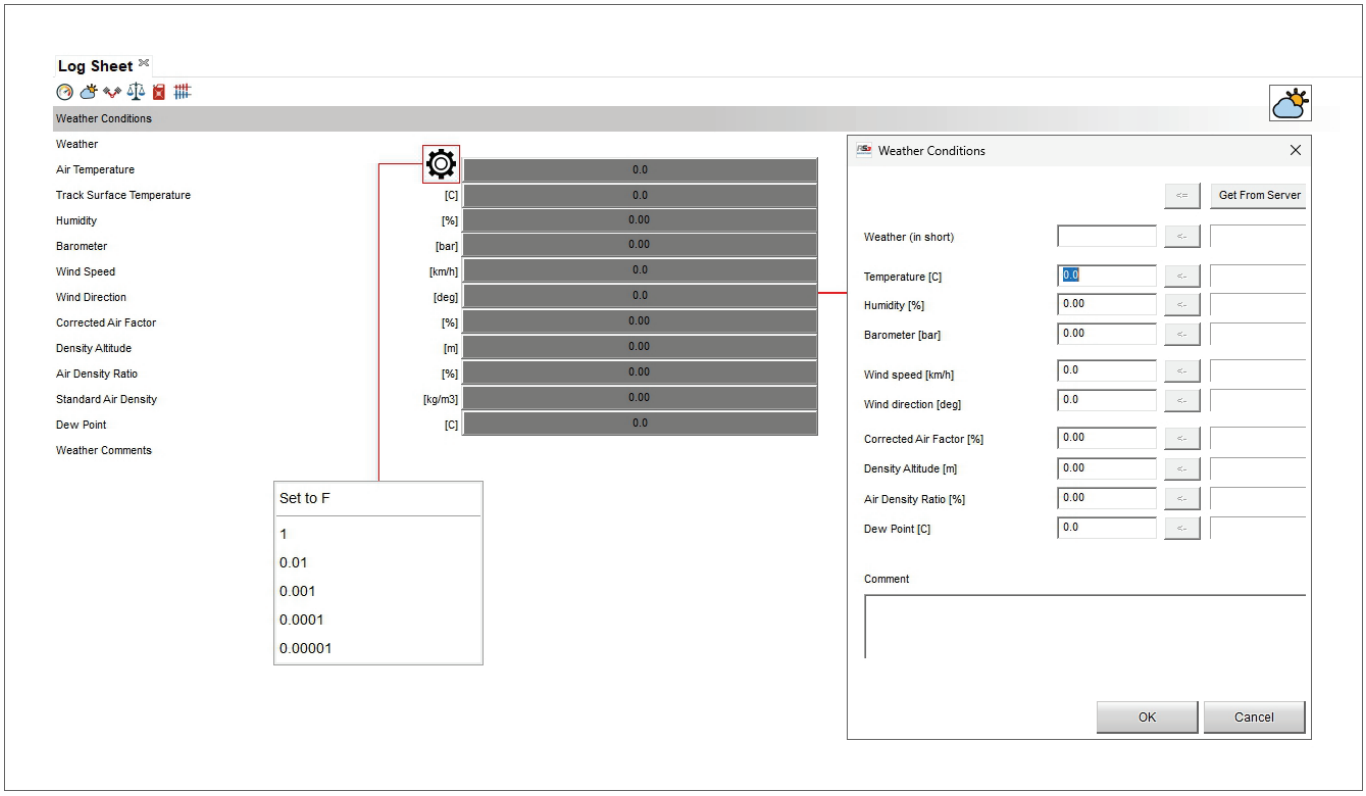
By default the view opens on "**General Information**" where it is possible to fill in information concerning the run and the vehicle through the related panels.

- mousing over the view a grey box appears in correspondence of each row
- click on it and the related panel appears
- fill it in
- press "OK"



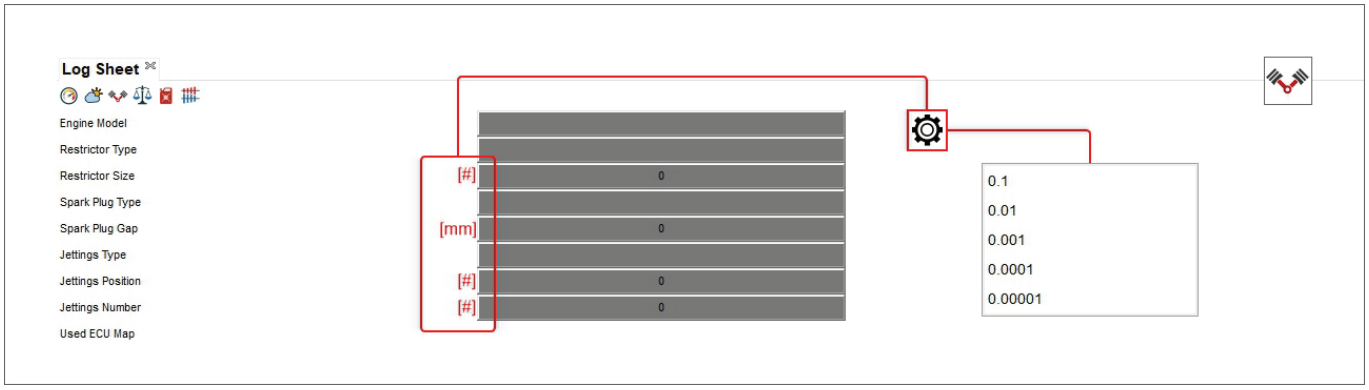
11.2 – Log sheet weather

Weather information come from AiM server that connects to the nearest weather station according to your GPS coordinates. Mousing over the view a grey box and a setting icon appear in correspondence of each row.
Clicking on the **setting icon** you can set specific condition of each parameter.
Double clicking on the **grey boxes** a weather conditions panel is prompted. If you have more accurate information here you can fill them in. In a second moment you can replace them (one or all) with the information coming from AiM server. Use "<-" to replace the single information and "<=" to replace all information.



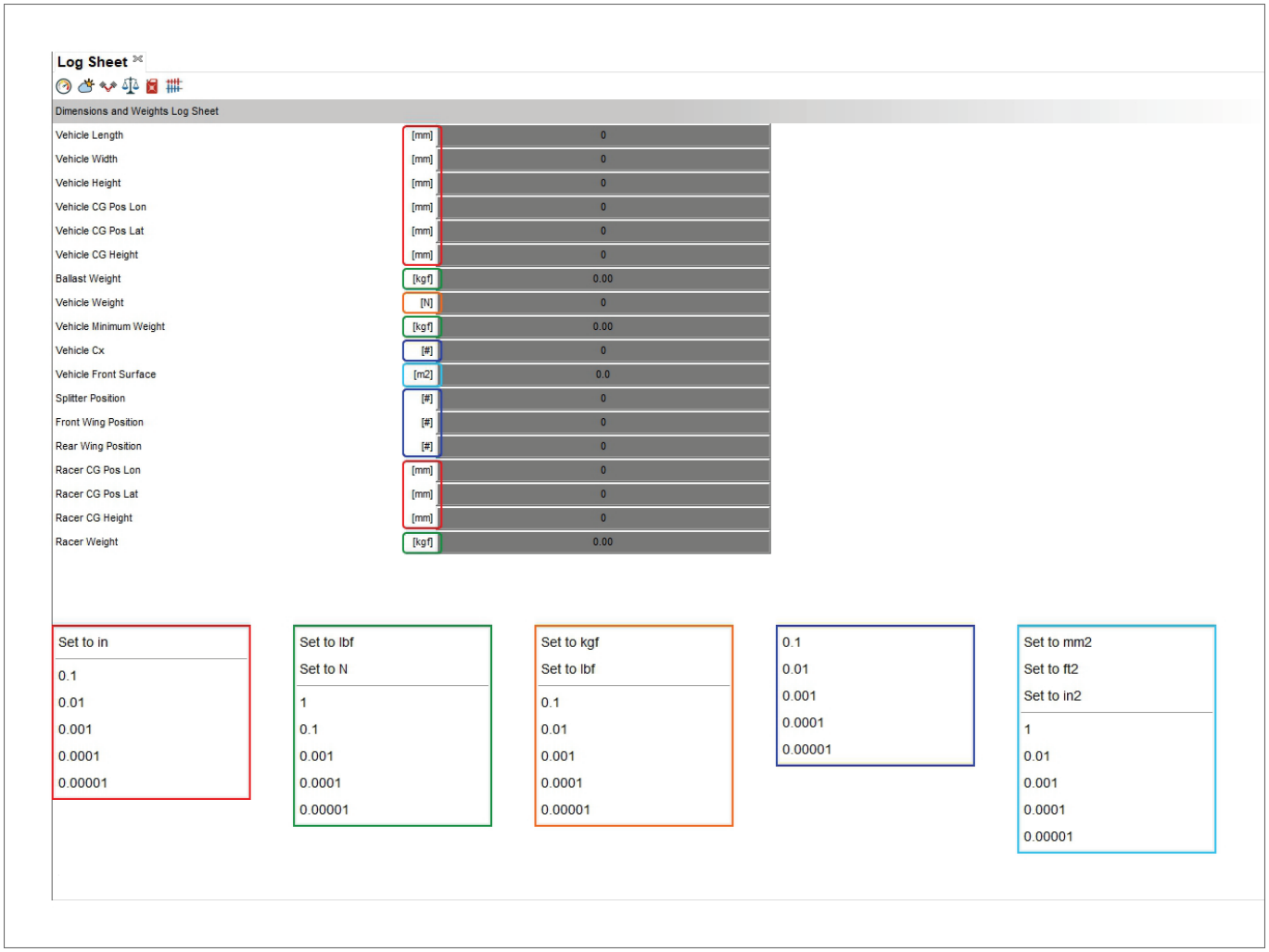
11.3 – Log Sheet Engine Information

In this view it is possible to fill in all information concerning the engine installed on the vehicle. Mousing over the lines where a Measure is to be filled in a setting icon is shown and clicking it a menu is prompted: here you can choose the number of decimal places.



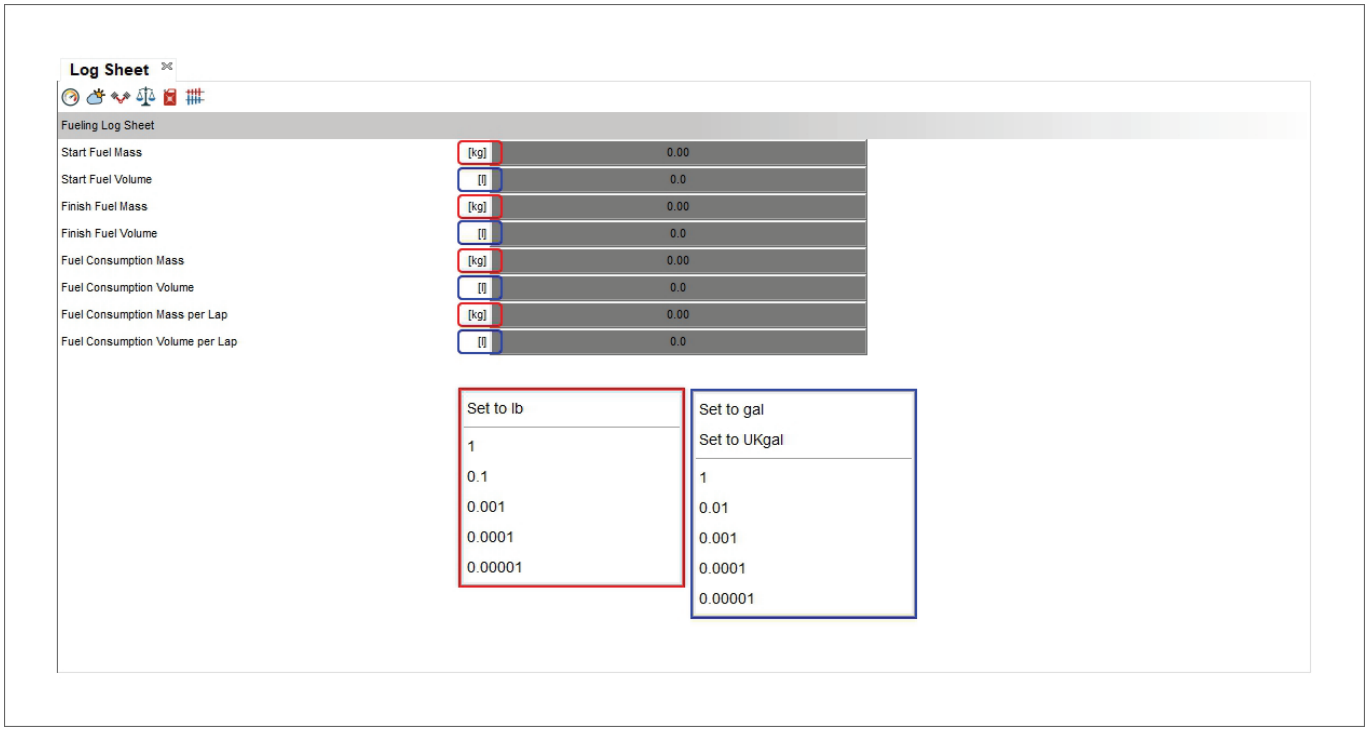
11.4 – Log Sheet Dims (dimensions) and Weights information

Here you can fill in information concerning the vehicle dimensions and weights; mousing over the lines where a measure is to be filled in a setting icon is shown and clicking it a menu is prompted. Once set the parameter and the number of decimal places, clicking on the grey boxes right of the measure unit a panel is prompted where the measures can be filled in.



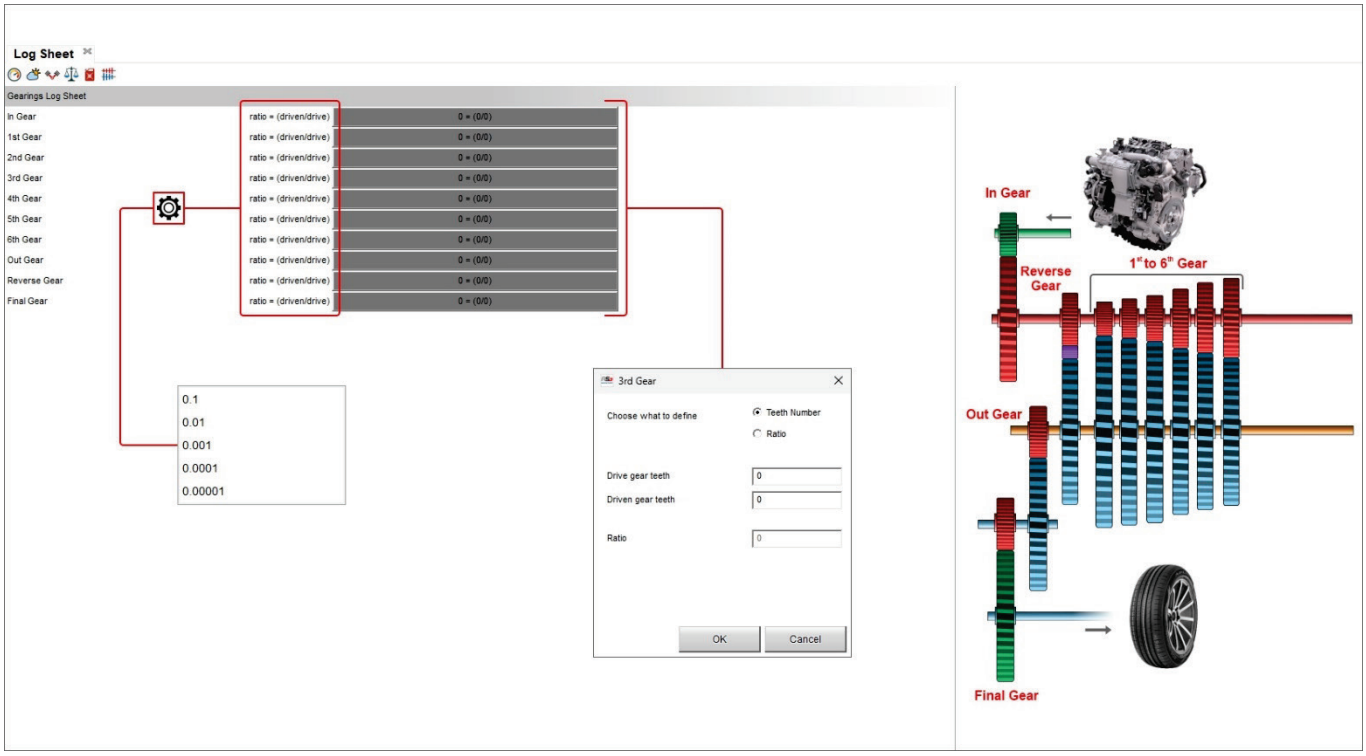
11.5 – Log Sheet fuel Information

Here you can fill in information concerning the vehicle fuel information; mousing over the lines where a measure is to be filled in a setting icon is shown and clicking it a menu is prompted. Clicking on the grey boxes right of the measure unit a panel is prompted where the measures can be filled in and/or converted.



11.6 – Log Sheet gearings information

Here you can fill in all the information concerning the gear management. Mousing over the rows in the left the image on the right highlights the item you are mousing over making the all view very user friendly.



12 – Track Map layout

This layout works as explained in paragraph 4.3.

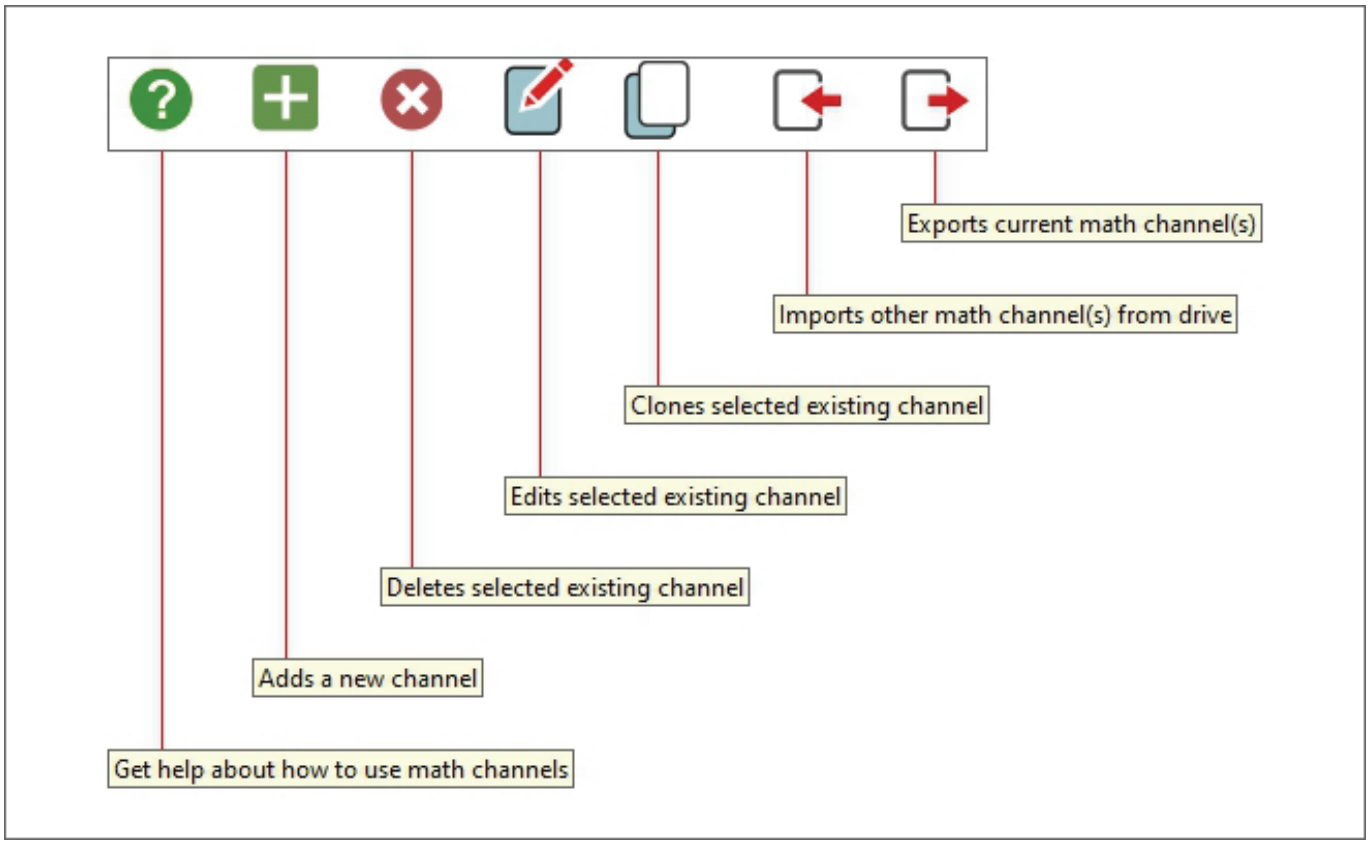
13 – Custom Layout

Here it is possible to Add/show/hide and delete custom layout. They work exactly like the profiles explained in paragraph 3.3

14 – 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 is prompted no matter which layout you are working on.

Top left of the view is a management keyboard whose buttons are shown here below.



Clicking on the question mark left of the keyboard you are re-directed to an online help page dedicated to math channels and explaining their significance and working mode. This page is constantly updated and improved.

Left of the view channels are grouped by type in the channels library; 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 or importing a channel created with different measure units RSA3 computes and shows the channel using the measure units You decided.

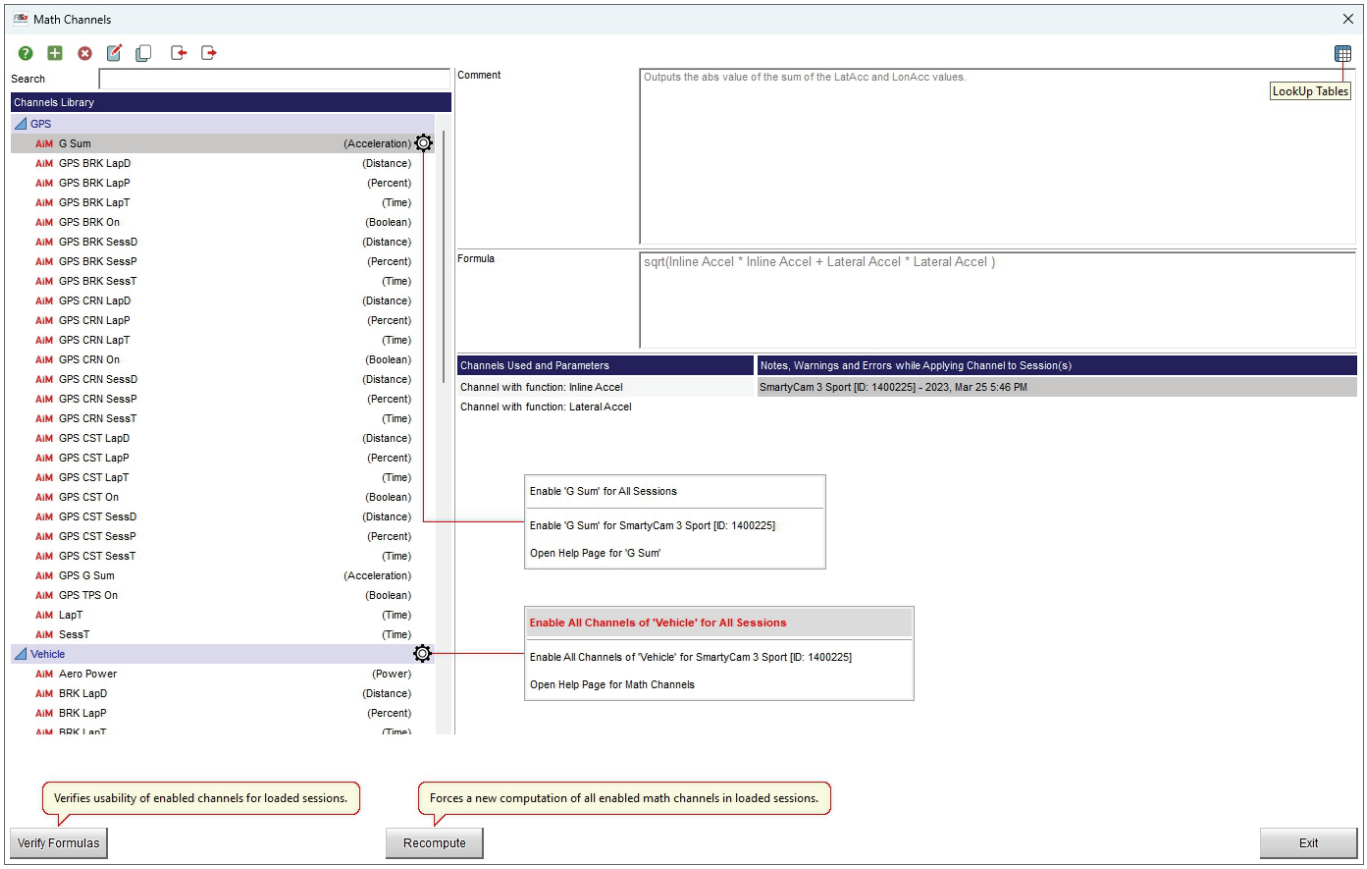
Clicking on the **setting icon** right of each channel it is possible to enable that channel for all sessions or for a single device as well as to be re-directed to the paragraph dedicated to that precise channel in the online help page.

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

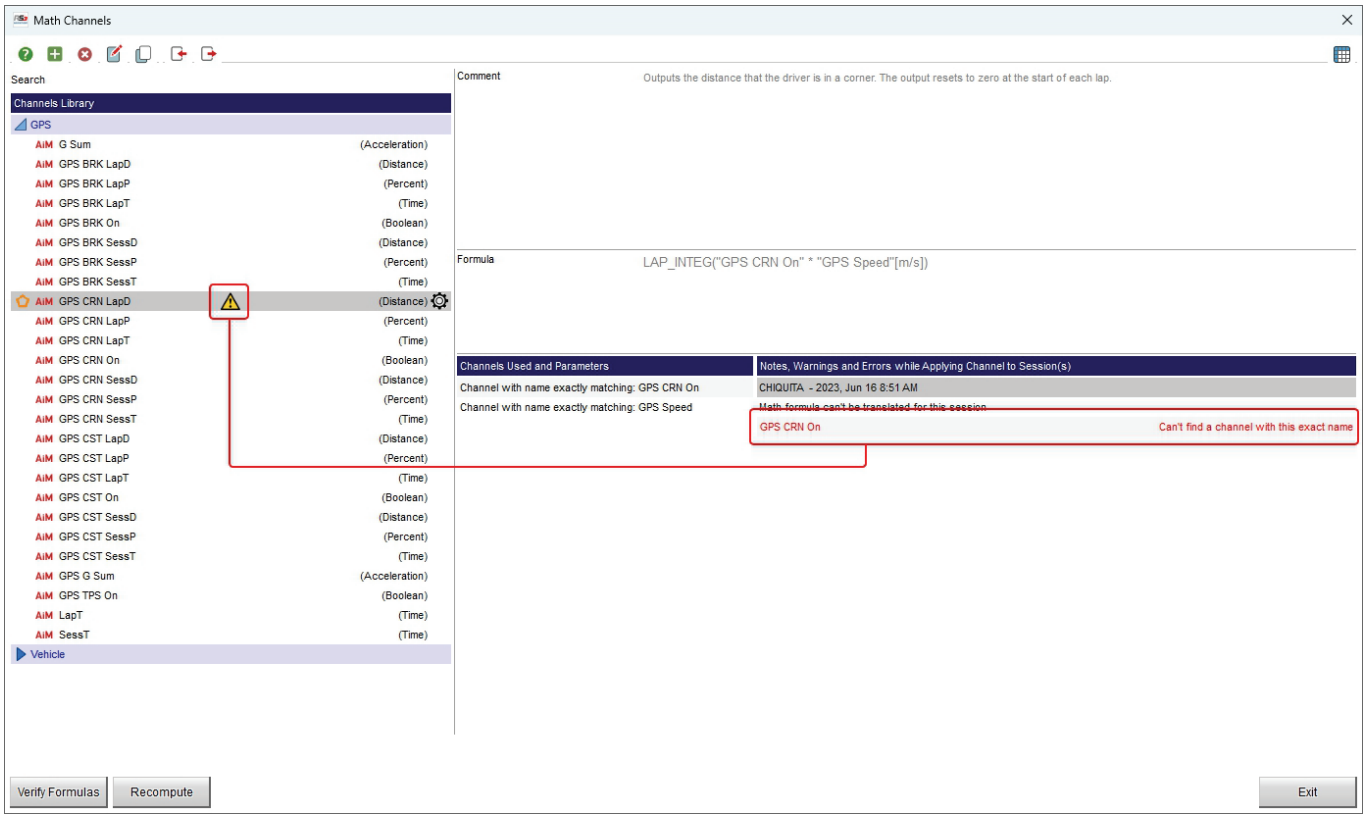
For every channel you select in the channels library, the boxes right of the view show a comment (on top), the computation formula (central) and two lists(bottom right): the first showing used parameters and the second with notes or warnings while applying the channel to loaded sessions. All needed channels are listed using an unit of measure.

The bottom buttons are used for:

- **Verifying Formulas**: verifies if the channels used in the formula can't be applied
- **Recompute**: completely recomputes all the enabled channels for every session that was selected before opening the math channels usage window

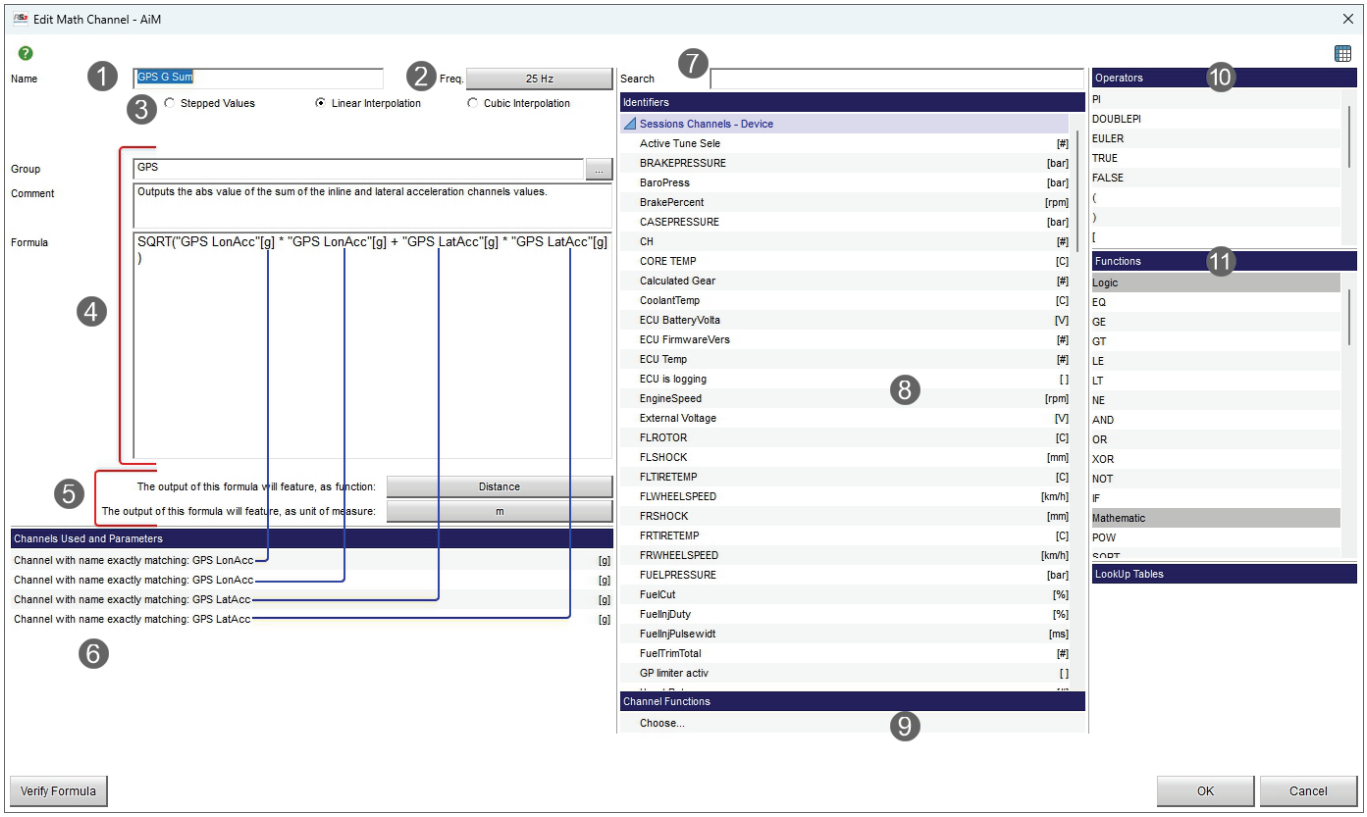


If any channel is for any reason not correct a waring is shown in the channels library as shown here below.



14.1 – How to add/edit a math channel

To add/edit a new math channel press the buttons here above on the top left keyboard and the related dialog window is prompted. Adding a channel the panel is prompted empty while editing one it is prompted as set and can be modified. Here below is shown a panel to be edited.

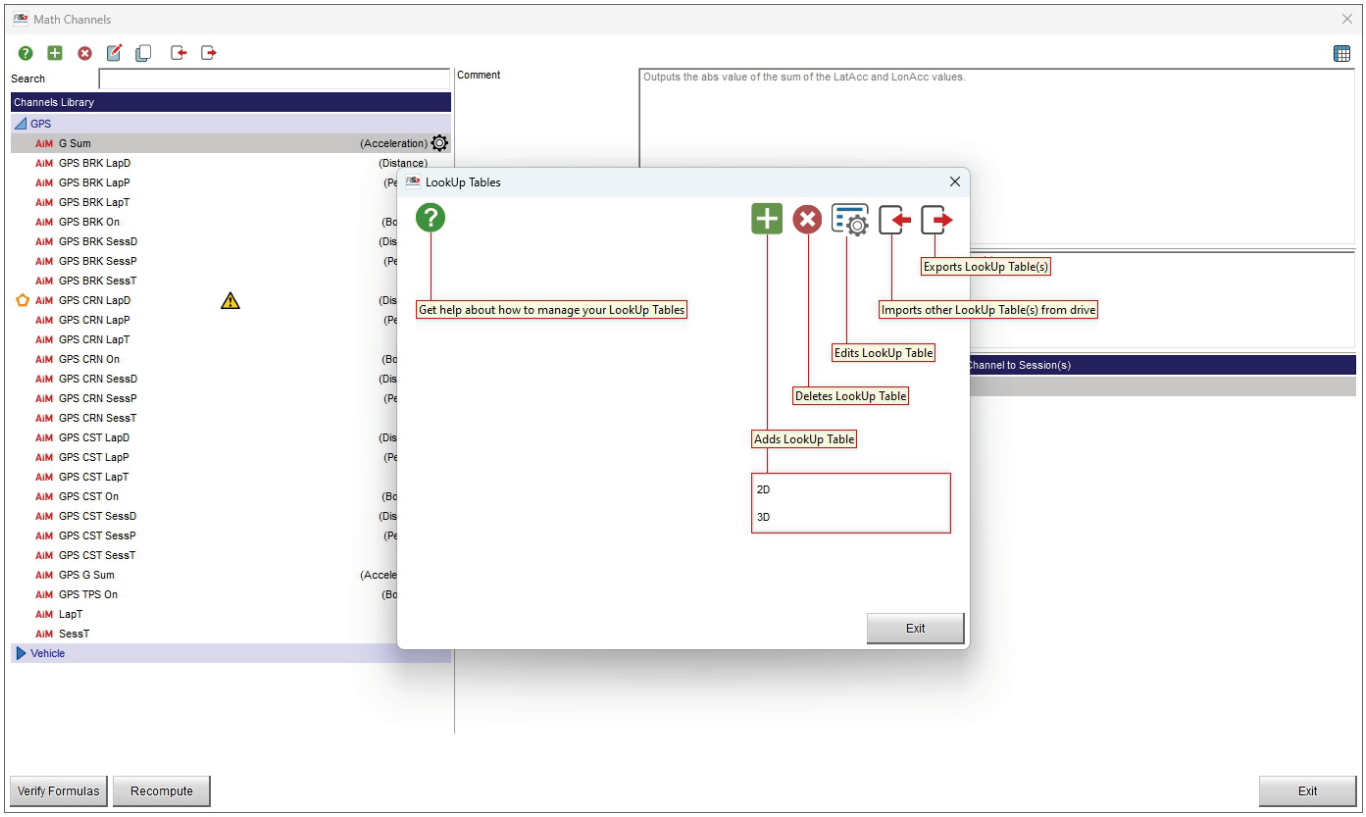


With reference to the image above:

- You need to choose/modify math channel name (**1**)
- Set/Modify the sampling Frequency (**2**)
- Choose/modify the computation mode (**3**)
- Select/modify the group the channels belong to, fill in a comment to explain it and the formula (**4**)
- According to the function of the channel select/modify the measure unit (**5**)
- The bottom left part of the view shows which channel and parameters are used for this computation (**6**). Please note: if any channel is not matching completely the channel name a warning icon ⚠ is shown in this field in correspondence to the channel that is not matching the channel name.
- Using the search box you can quickly find a channel (**7**)
- All identifiers are shown in the corresponding box (**8**)
- Channel function can be selected/modified in the corresponding box (**9**)
- Operators (**10**) and functions (**11**) are listed in the right boxes of the view
- Look up tables (**12**) are explained in paragraph 14.2

14.2 – LookUp tables

Using the above shown icon in Math Channels setting panel it is possible to add/remove/Edit/Import/Export lookup table.



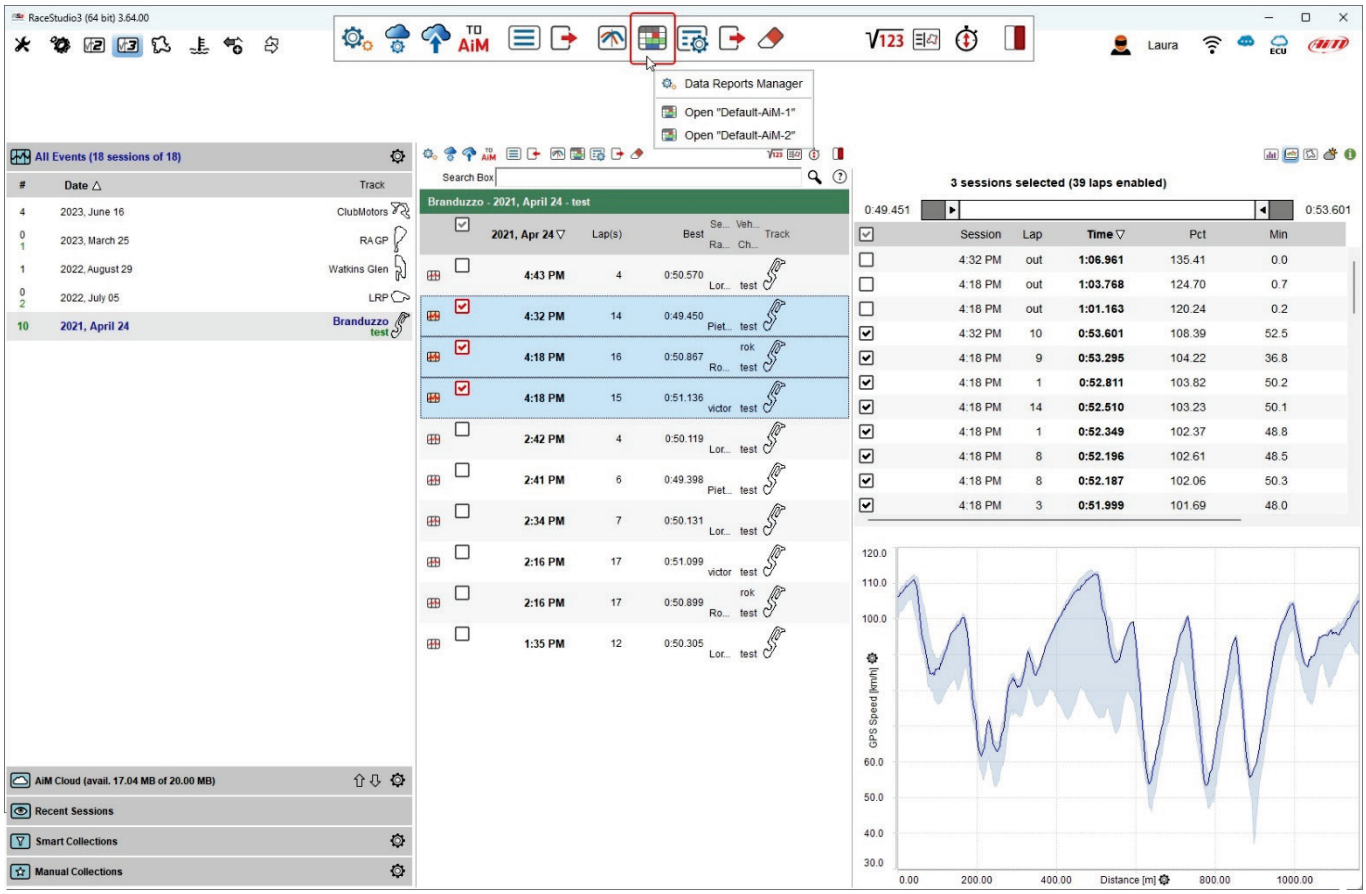
LookUp table is a special function of Race Studio 3 Analysis whose working mode is very close to what custom sensors do for the configuration. You can define a "curve" according to which, given the value of one or two channels, you define the output value. Look up table can be:

- **2D**: the curve appears like a line on a plot, with "X" value as input and "Y" value as output
- **3D**: the curve appears as a surface in space, with "X" and "Y" values as inputs and "Z" as output.

15 – Reports layout

In Race Studio 3 Analysis home view is “Reports” function; it allows to make a quantitative analysis of different performances (vehicle or pilot) and can be applied to different vehicles of a team or to the same vehicle for an entire week end. Using this report you can compare selected channels values for the entire laps or for different track part (corners and straights). Most useful reports are these referred to GPS Speed and GPS Acceleration.
Available statistics are: min/max/average values, range, delta, absolute value of average, average when not zero, integral and integral of absolute value. You can also decide to see the values for entire laps only as well as for desired track sectors.
The comparison can be made for all laps or for a selected number of best laps, for laps with best splits or considering a fixed percentage around best lap.
By default Race Studio 3 Analysis software provides two samples of reports named “Default AiM-1” and “default AiM-2”.
To enter Reports Manager:

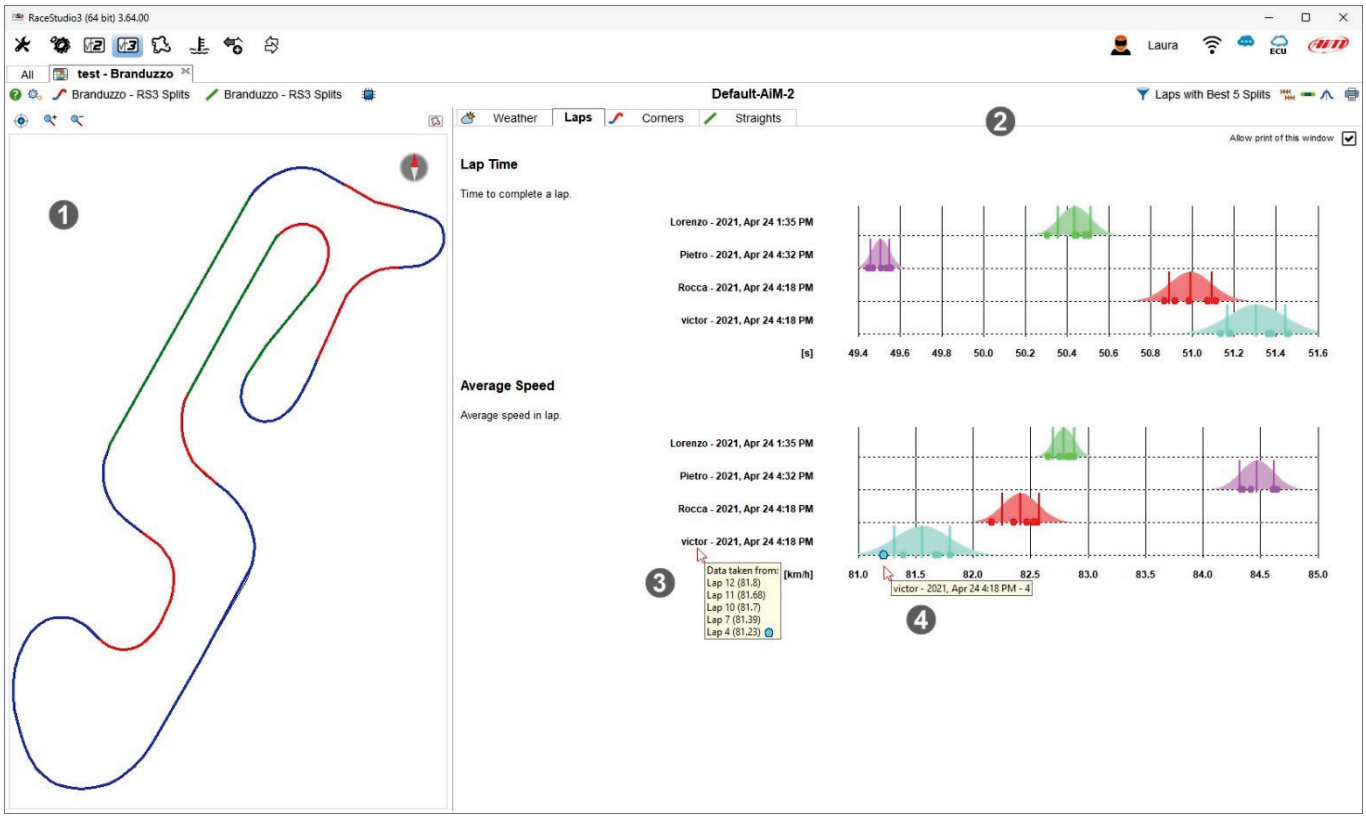
- Select the sessions you want to see the report of
- Click the above reported icon in the software main page
- Select the report you prefer or choose “Data Reports Manager” to add a new one.



The software enters Reports page view. In the example below we selected “Default-AiM-2” example.
The view below shows:

- track map CDI mode on the left (**1**)
- report on the right (**2**)
- mousing over the report view a tooltip showing which data are taken is prompted (**3**)
- mousing over the graph right of the report a tooltip for each point of the graph is prompted (**4**).

Each part of the view can be customized as we will explain in the following pages.

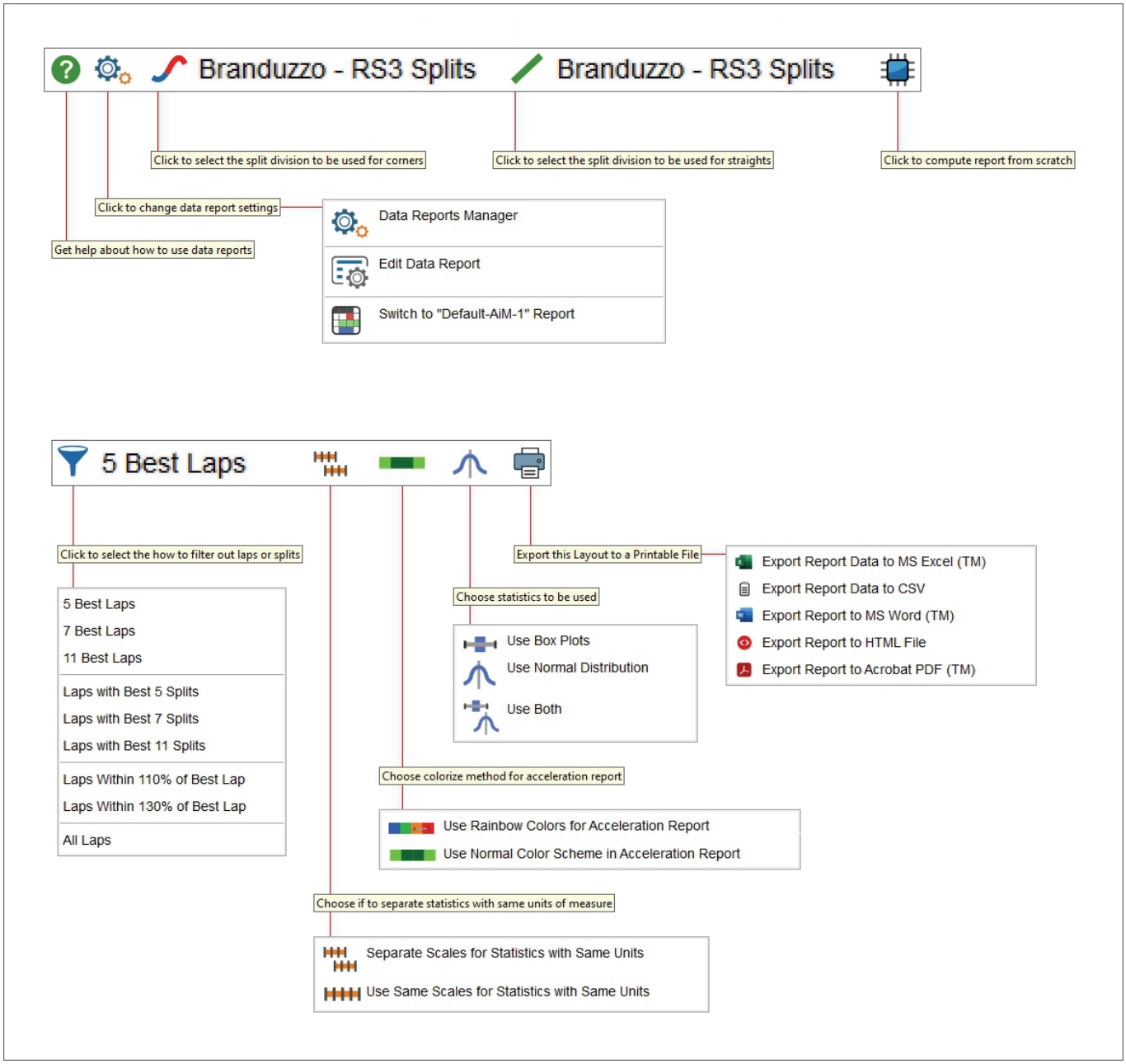


Top left and top right of Report view are two toolbars.
We start from **the left toolbar** (**top** one in the image).

- through the **question mark** you are redirected to an online help page
- the **setting icon** allows you to manage the reports, creating a new one included, edit the current report or switch among different reports
- **corners** and **straight** split division used for the report are these you previously created or default ones
- through the **scratch** icon you can reset the report computation.

Right toolbar (**bottom** one in the image):

- through the **funnel icon** you can select the laps or the range of laps to be used for the report
- right of it is the icons that allows you to decide whether keeping the same **scales** for similar statistics and decide if using normal or rainbow colour for acceleration report
- graph can use normal **distribution**, box plot or both and data can be exported in different format through the **printer icon**.



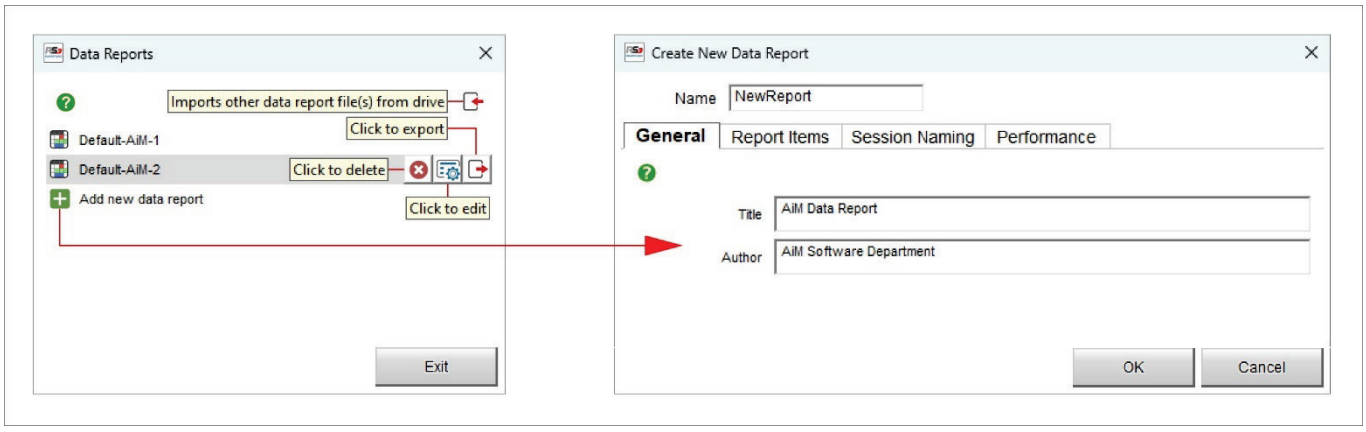
15.1 – Managing, creating and editing a data report

Race Studio 3 software provides two Reports sample named “Default-AiM-1” and “Default-AiM-2” and allows you to import others from a drive as well as create new ones.

To **choose a default report model**:
- press the above reported icon
- select “Data Report Manager” item
- select the desired model in the panel that is prompted

Please note: mousing over the available reports some icons allowing you to edit, export and delete them are prompted; moreover using the top right icon on “Data Reports” panel you can import data reports from a drive

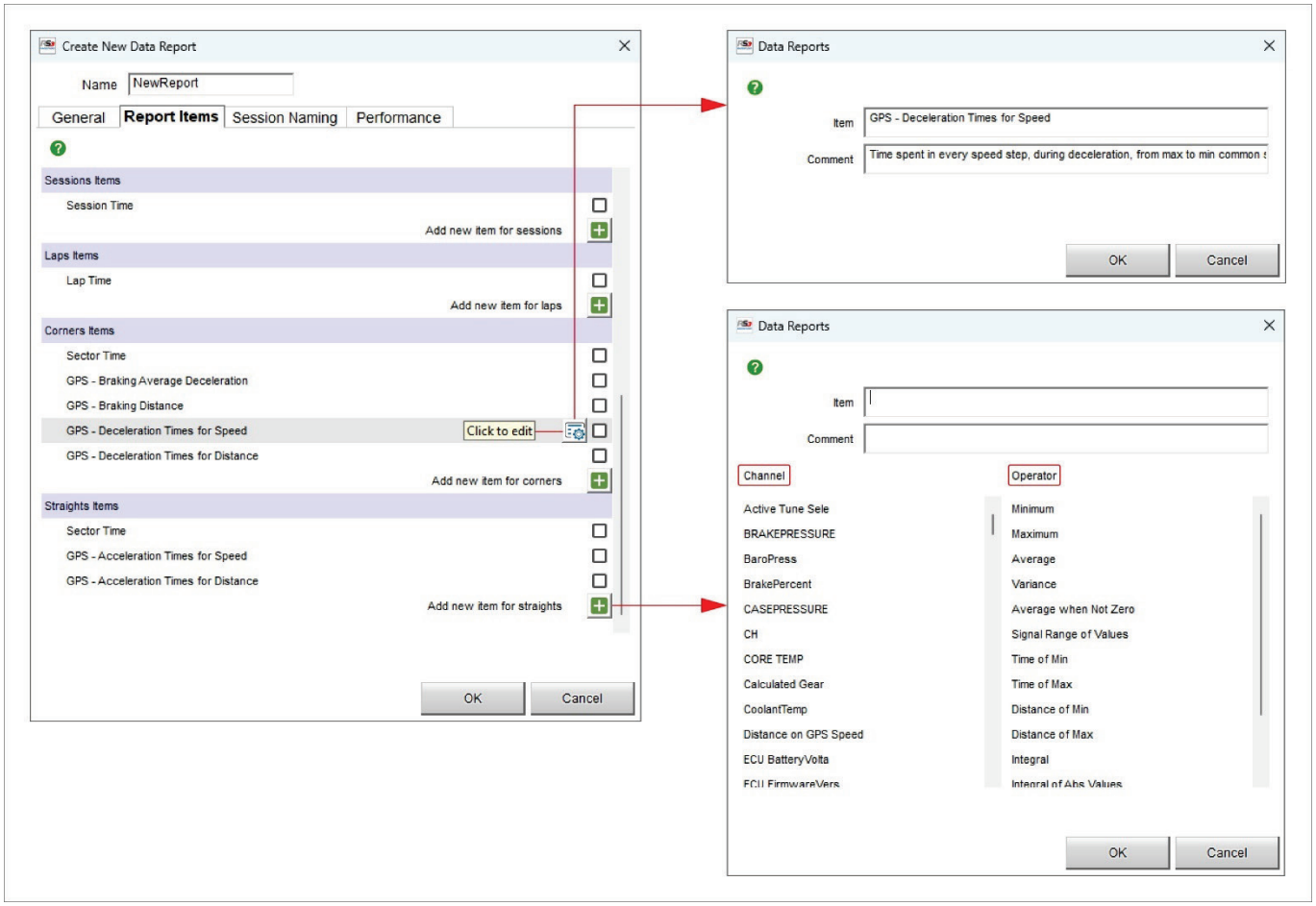
To **add a new report**:
- press the above reported icon
- select “Data Report Manager” item
- select “+” icon in the panel that is prompted and a new panel is shown: fill in “Title” and “Author” and then set up the other tabs explained in the following pages.



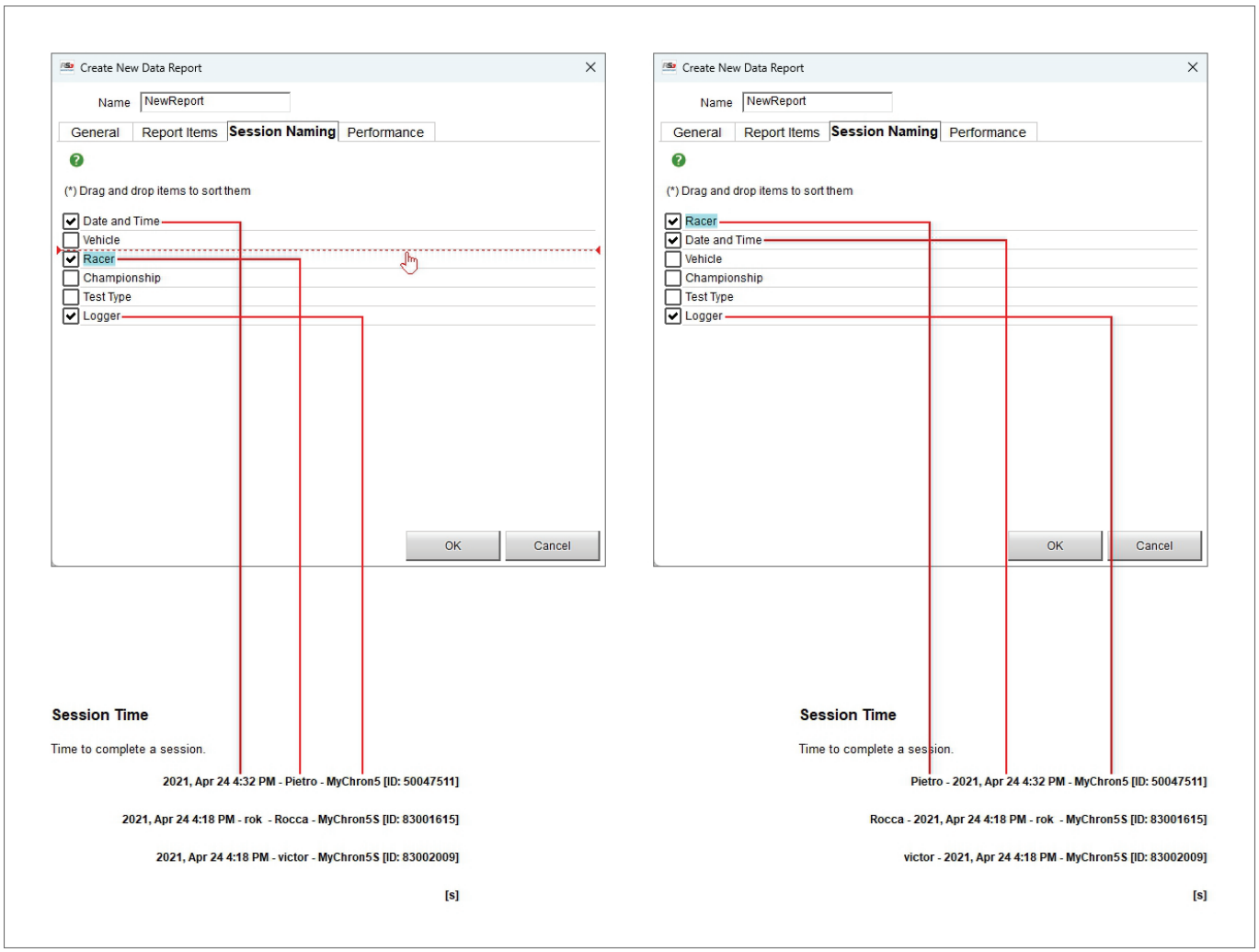
"**Report Items**" tab includes Sessions, Laps, Corners and Straight Items. They can be enabled with the related checkboxes or added pressing "+" icon.

Adding a new channel the corresponding setting panel is prompted:

- fill in Item name and comment
- select the channel on the left and the operator on the right of the panel as highlighted below
- press "OK"



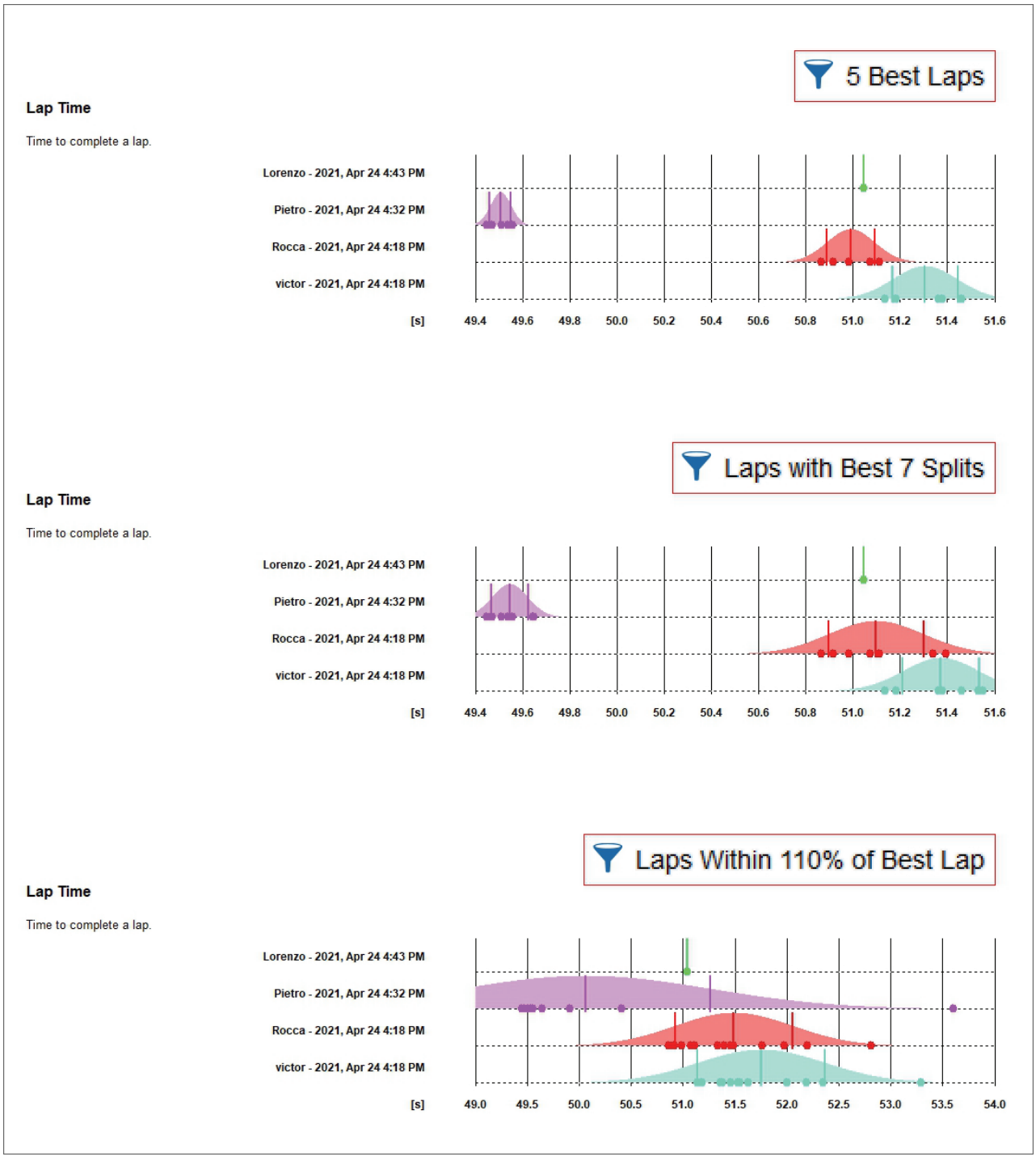
"**Session naming**" tab
Each session can be named using pre-defined fields you can enable/disable and displace in the dedicated tab. After having enabled the voice you want to use drag and drop it in the desired position and the session name will be changed as shown here below.



15.2 – Filtering data for laps and splits report

As shown here below, using the above reported icon it is possible filter data to be used for the report. Available options are:

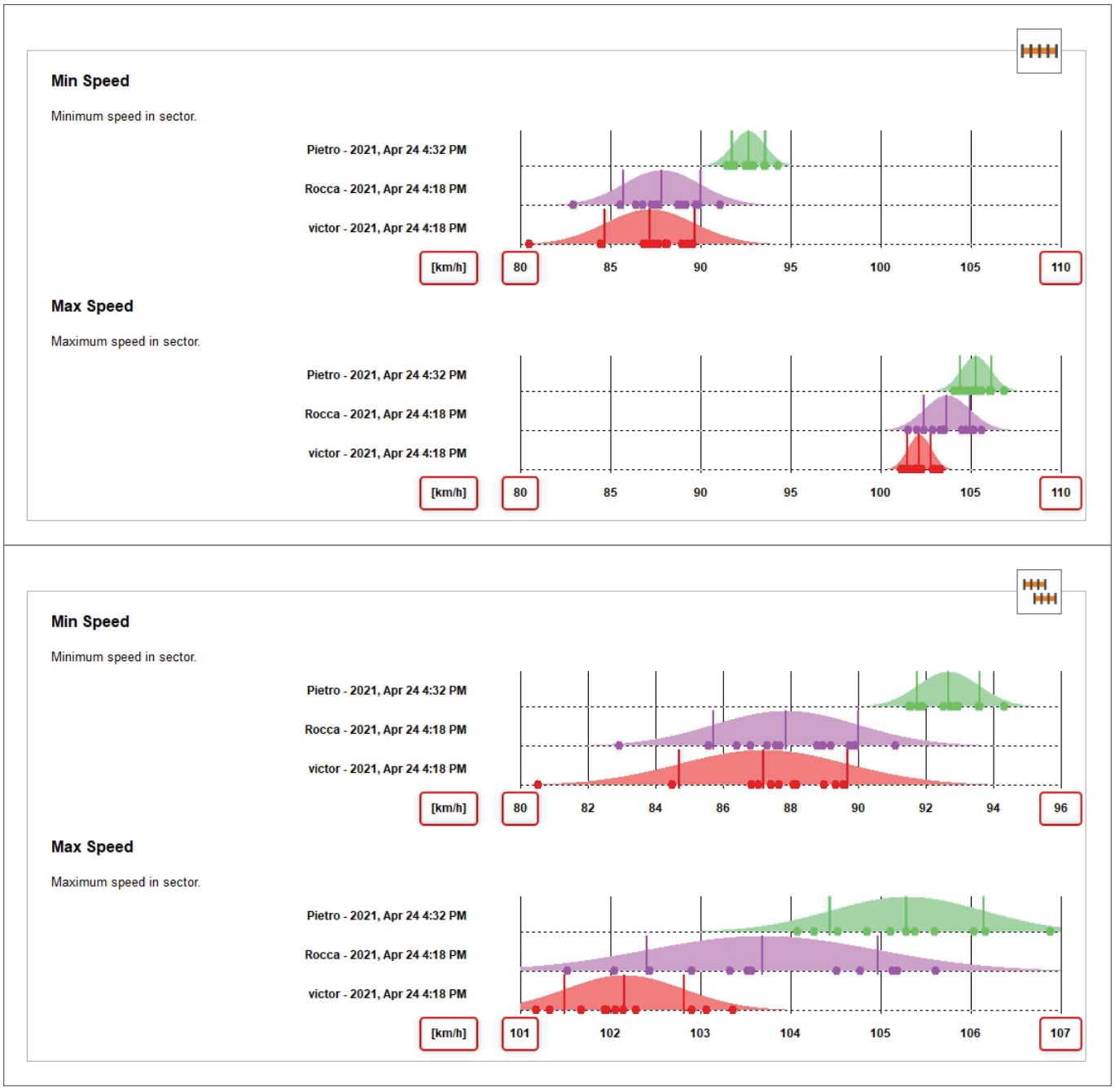
- 5, 7 and 11 best laps
- Laps with best 5, 7 and 11 splits
- Laps within 110% or 130% of best laps
- All laps



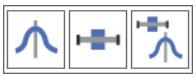
15.3 – Management of scales for statistics with same units

Using the above reported icons the graphs can have on the abscissa axis:

- the same scales for statistics with the same units (top in the image below) or
- different scales for statistics with the same units (bottom in the image below)

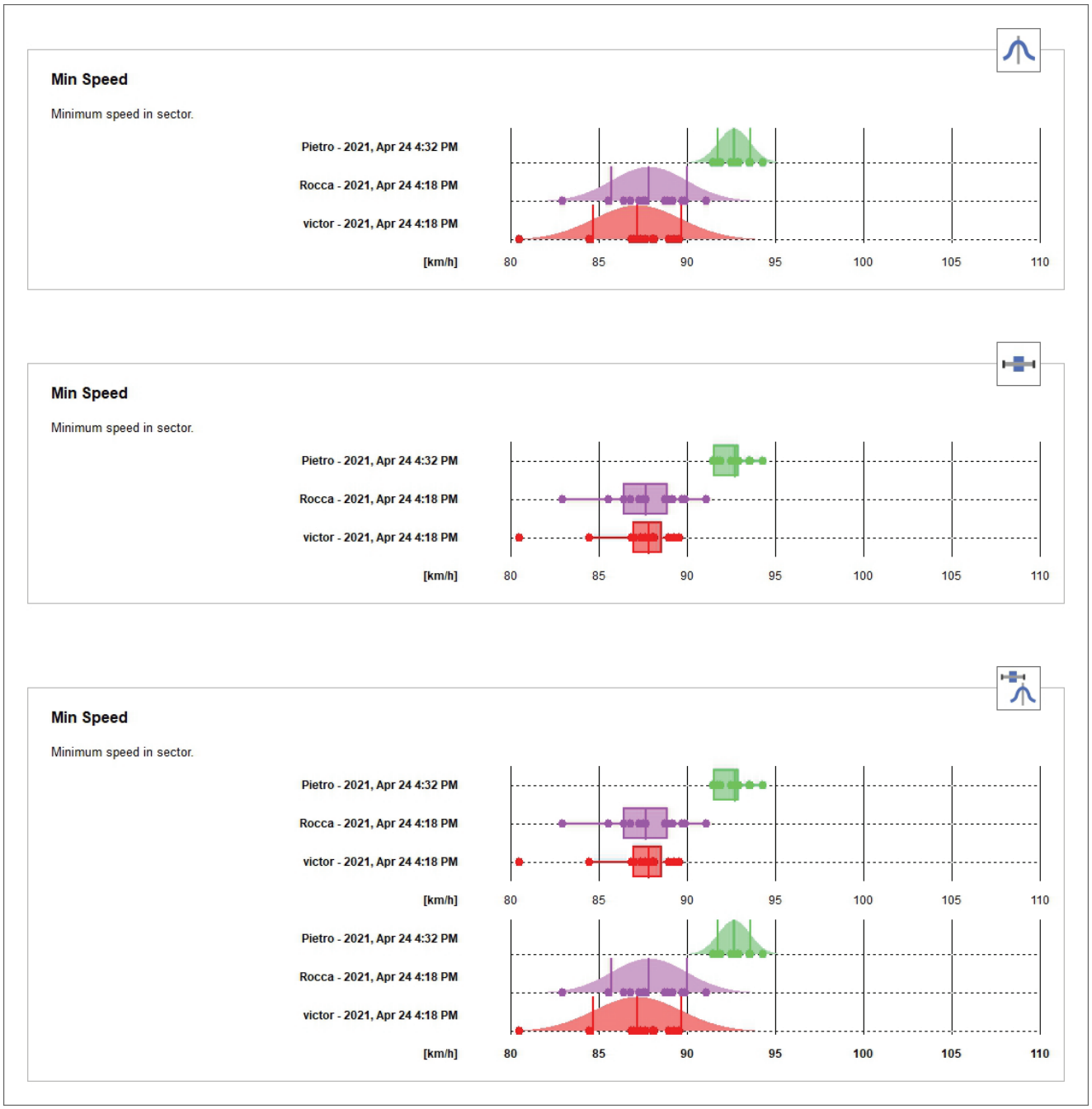


15.4 – Choosing the statistics to be used

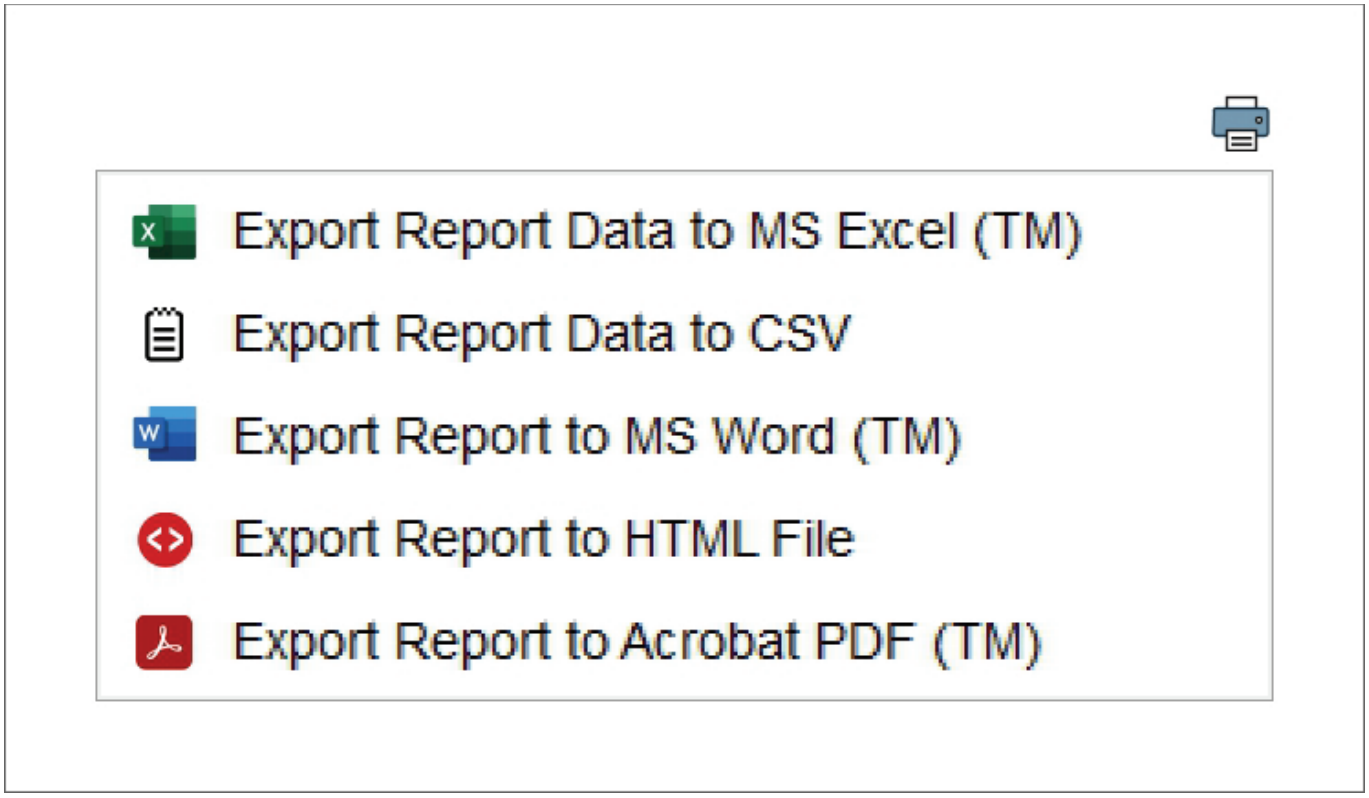


Using the above reported icons (from left to right normal graph, box plot, both) it is possible to represent data with different graphs:

- **normal graph (top)**: using sampled data a gaussian bell of the probability density function is built; the three vertical lines are: average value, plus/minus the standard deviation
- **box plot (central)**: are a visual picture that compares sets of data for central tendency (location) and variation (process spread); the line segmenting the box represents the median data value; left and right of the box are first and third quartile, respectively; quartiles represent 25th and 75th percentile of the data spread while whiskers extend to highest and lowest samples, given that those samples do not exceed the median value plus/minus 1.5 times the interquartile range; samples exceeding the whiskers are plotted as outliers
- **both (bottom)**



15.5 – Exporting data reports to printable files

All reports can be exported in different formats, to say:

- Microsoft Excel™ (exports report data)
- CSV (exports report data)
- Microsoft Word™ (exports a printable file)
- HTML (exports a printable file)
- Adobe Acrobat™ PDF (exports a printable file)