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Laptiming Analyzer

Description:

At 2D modules, laptimes can be created in many ways, e.g. using GPS coordinates or TransponderX2 messages as lap trigger signals to display the lap time live at the track on 2D dashboards.



Documentation reference

Respective manuals can be found at our website: www.2D-Datarecording.com/manuals/

Beside these two live functionalities it is also possible to create and analyse the laptimes in post-processing in Analyzer.

Even the GAP time function can be readjusted in the Analyzer in post-processing.



Documentation reference Respective Dashboard manual with information for GAP time functionality can be found at our website: www.2D-Datarecording.com/manuals/

Create laptimes in Analyzer (via GPS coordinates)

- 1. Make an installation lap to get an accurate GPS measurement of the circuit layout and open respective measurement in Analyzer.
- 2. Open measurement with GPS channels in Analyzer
- 3. Set marker by left click on desired finish line position
- 4. Open submenu by right click.



5. By clicking on **<Set GPS start line>** the position of the marker can be saved as line file and also is set as new finish line when confirming the following message with **<OK>**.





- If no laptriggers are created by clicking on *<OK>* please check the Timeout settings MinLapLength and MinLapTime in Race.ini in application data directory (WinARace → shortcut *<CTRL>* + *<ALT>* + *<D>*)
- 6. Via Analyzer tab Functions (or shortcut *ALT>* + *L>*) the laptime overview can be

opened

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Post-processing Time/Distance channels



Further Information

A measurement of the BMW M1000RR in Hockenheim was used as an example

Preparation:

- 1. Open REFERENCE measurement in Analyzer
- 2. Navigate to reference lap (e.g. fastest lap) and adjust zoom and view that only reference lap is shown in moving window



Further Information

() 0: 2:23.539 min

1: 2:05.364 min
 2: 2:00.916 min

3: 1:57.812 min
 4: 1:57.023 min
 5: 1:40.246 min

LL N

km/h

l

■2D-Analyzer 2021:37:3:23 Team lifer File Functions View Measurement 5 □ → ⊕ → □ ③ ① Ⅲ 1 Image: I

 Load comparison lap of same measurement (e.g. via dropdown menu) or lap from other measurement



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4. Switch x-axis unit from time [V(t)] to distance [V(s)]



Further Information

When comparing laps, it is better to use the distance as x-axis, as the lapmeters do not vary as much even with different lap times.

5. Align measurements that both start triggers are overlapping





Further Information

By using **<page-up>** and **<page-down>** keys it can be jumped between the <u>same</u> positions of <u>different</u> laps in measurment!

6. When reference and comparison lap are aligned, link the two measurements by

pressing the marked button or key <v>

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Activating channels:

1. Open the channel list by pressing the marked button or using shortcut $\langle ALT \rangle + \langle u \rangle$

2D - Analyzer 2021.37.3.23 Team licence <fs> (Event configuration mode: Multiple) 0703-STICK25HZ-04</fs>						
File Functions View Measurement Settings Wizards Plugins Tutorials Help						
🖆・骨・四 🕲 ひ 🧱 払・ 😂 ½ 巡 🖩 雇 概 🔯・ 🐵・ 🗮・ 😤 🐒	<gap setting=""> 🔍 🕍 🕅 🕅 🙀 🖉 💭 💬 🏆 🗉 🗷 📰</gap>					

2. Select filter for virtual channels

Measurement								
% 2 0524-BMW_M-11	~	16000 Hz 0524-BMW_N	4-11.MES					
Channel names	Channel types							
peed search:	Digital 🗌 👖 Ar	nalog 🗌 🔨 Can In	🗆 👬 🛛 Calo 🗌 📳	Virtual 🖂 💙				
hannels Groups								
Channels								
ir Channel	Visi	🐢 Scaling Overvit Lower lin	nit Upper limit	Color Redu	All Key		Start	Ruler/Alarm Color s Arranged I
4 🌳 Time dill [sec]		-1.00	1.00	AVG		25		Left
6 🌳 Win change [sec/sec]		-0.500	0.500	All	E	25		≸ Left
5 🌳 TDiff window [sec]		-1.00	1.00	AVG		25		S Left
7 🌳 Meter diff [m]		-30.00	30.00	All		25		Left
8 SMDiff window [m]		-30.00	30.00	AVG		25		fe l



Further Information

For all channels different colors and scalings can be freely chosen!

Channels	Unit	Description
Time diff	[sec]	Time difference between reference and comparison lap between laptriggers
		 Negative → comparison lap slower
		 Positive → comparison lap faster
Tdiff window	[sec]	Time difference between reference and comparison lap only in visible part of moving window
		 Negative → comparison lap slower
		 Positive → comparison lap faster
Win change	[sec/sec]	Derivation of channel <i>Time diff</i> for better visualization of the places where time is gained and lost.
Meter diff	[m]	Distance difference between reference and comparison lap between laptriggers
MDiff window	[m]	Distance difference between reference and comparison lap only in visible part of moving window



Further Information

If Win Change is switched on, always Time diff also is activated!

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Example Time diff:



As a result of braking 25 m later in comparison lap, the rider effectively wins 0.51 sec time in compared to reference lap (*Time diff* from $-0.27 \rightarrow +0.24$) at acceleration, but because of the higher velocity at the straight, the rider misses the brake point, and loses time again. The gap of about 0.16 seconds hardly changes during Parabolika.

At the end of the comparison lap the rider has lost in total 0.66 sec (Time diff -0.66 sec) seconds compared to reference lap.



Example Win change

The time gain because of later braking in comparison lap described above can be better read from the channel *Win change*, because if this is in the positive value, there is a time gain because of better acceleration phase. Also missing the brake point at the end of the straight becomes obvious due to the rapid change to a negative value of *Win change*.

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Example TDiff Window:



In order to anlyse only desired sections of a lap the *TDiff window* channel is used and the position of the moving window is changed, e.g. that Parabolika is at the beginning of moving window, as this channel always calculates the time difference from the current position of the moving window.

This very quickly reveals significant positions where the driver loses or wins time in different sections of the comparison lap.

<u>FAQ</u>

- 1. Time diff channel cannot be activated in Analyzer for displaying
 - → In Analyzer open tab Settings → Track → Track settings and check box Event measured on closed track

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