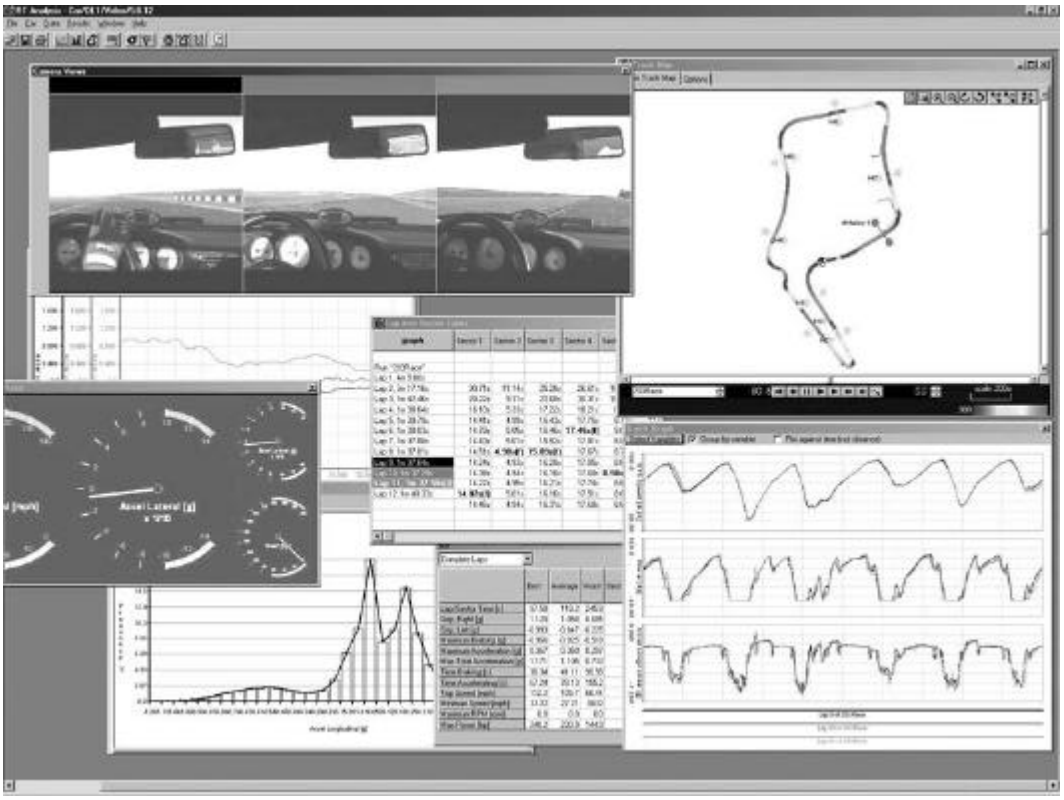
Data Analysis Software



- Compatible with all Race Technology products
- Fully integrated video support
- Accurate track maps
- Graphs generated with a single mouse click for fast analysis
- Automatically splits tracks, into laps and sectors based on straights
- Flexible, powerful graphing
- User defined variables and filtering to support any sensor
- Almost unlimited laps and up to 99 sectors per lap
- Versions for Cars, Boats, Bikes and Go Karts
- Export options to Excel and Matlab

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What is the “Data Analysis Software”?

The Race Technology “Data Analysis Software” is the main application that comes with all Race Technology products and, as the title would suggest, allows you to analyse your data in a multitude of ways. For example you can use the software to look at lap/sector times, acceleration times, braking points, oil pressures around the track, compare runs etc. etc.

Who is the “Data Analysis Software” designed for?

The data analysis software is incredibly flexible and allows our products to be used in applications where other “auto sport” data logging systems would be unacceptable. The data analysis software can be used to analyse data logged on closed circuits, open circuits (hill climbs and rallies for example), straight line performance testing, to name just a few. Drivers, technical support staff, instructors, racing teachers and students use the software extensively.

What does the “Data Analysis Software” do?

The software is so powerful and flexible that this isn’t a simple question to answer in a few sentences. The software is used to download data, view it, analyse it, manipulate it, graph it, print it, save it to disk etc. It has many powerful and innovative features and is under constant development to ensure that it remains the package of choice for drivers, racing teams, test engineers and vehicle development organisations.

What are the key competitor advantages of the Race Technology analysis software?

Our data analysis software is totally unique in it’s capabilities, power and flexibility, even compared with other high-end systems. It includes complete integration of GPS and video data in a package that is fast, flexible, configurable, powerful, and yet remains user friendly.

Features of the data analysis software

Naturally, our analysis software has **all the functions you would expect** from a “standard” data analysis package: lap and sector times, track maps, graphs and comparing your current lap with a **theoretical lap** etc. But this is just the start; the Race Technology software contains many more features that set it apart from others and give you the **competitive edge**.

Our software is far more **powerful and scaleable** than you will be used to. Over **20 runs** can be simultaneously loaded and compared, each with almost **unlimited laps** and up to **99 sectors per lap (computer memory permitting)**. In addition you can load up to ten video streams per run, and add over **100 of your own user defined variables** if required. Finally, there is no hard limit on the number of graphs and bar charts that can be generated. Compare that to your current system!

The first function that the software must perform is to transfer the data from the logging device to the computer. In the case of the DL90 and the AP22 this is done with a serial (RS232) link running at high speed, in the case of the DL1 and the AX22, data is read from the compact flash card using a suitable card reader attached to the computer.

The next task the software does it to convert the data that was stored into useful information. For example the logger might record a number of pulses per second on an input, and this needs to be converted to an engine speed in RPM. Alternatively it might convert a voltage that was stored on the logger to a steering wheel angle. The number of variables calculated and the units can be selected to the users preferences.

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Once the data has been converted into useful "engineering" data, the software can be used to look at the data. This can be done in one of many ways – the most straightforward is to simply plot a graph. In the most simplistic example you could plot the speed the vehicle was travelling against time.

While looking at data in such a manual way does provide answers, a more powerful way to look at the data is by using the analysis features in the software. For example you can select a bend on a circuit and automatically plot the lateral g force of that corner on your fastest and slowest laps. Alternatively you can check to see how brake pressures or vehicle power output changed over the course of the race or event.

In addition to the analysis functions there are extensive facilities to load and save data, load and save your analysis preferences, print graphs, and export data to a spreadsheet.

The latest version of the Race Technology software is another huge step forward in terms of power and flexibility. Some of the features include:

- **Video**. One of the newest and most innovate features of the software is the seamless integration of video allowing data-by-video and video-by-video. For example, when you click on any graph you get the associated video, or when you play the video back you also get the data along side. Video is a huge advantage when it comes to analysing the data – it gives the data "context" making it immediately understandable for both engineers and drivers. You can even export videos with a data overlay if required. This combination of features is not available in any other analysis package irrespective of cost.
- **Flexible XY graphs.** Each XY graph can display up to 5 totally independent X and Y axis, for example you can view speeds from 5 different laps, or 5 different parameters from a single lap. There are also numerous options that can be set as require, for example you can manually set minimum and maximums, whether a grid is displayed and whether you want data point joined up or not. There are also extensive facilities for zooming in on the data, panning across the axis etc, so you really can view the data in a fast and efficient manner.
- **Flexible bar charts.** The bar charts are useful for viewing "how often" something happened. For example you could check what rev range was used during a race to help select appropriate gearing. As with the regular XY graphs, you can view up to 5 axis at the same time, making comparison between laps or runs very simple.
- **Track maps.** One of the great strengths of our range of data logging products is the integration of GPS, which allows the system to calculate high quality track maps. The track map viewer makes the most of the data and shows a full layout of the track or run. There are many viewing options available for the track map, including colouring the map to show sections of high speed or braking. There are also facilities for quickly zooming in and out the map, rotating it and so on.
- **Real time playback.** One of the innovative features of the software is its ability to "playback" the data in real time. This mode operated very much like a video recorder, you can play, pause, fast-forward and even rewind the race and see exactly what was going on at that particular time.
- **Virtual dashboards.** As well as displaying the data on the graphs during playback you can also display a configurable "virtual dashboard" to show the chosen variables on dials for quick and intuitive readings.
- **Multiple runs.** Obviously it is essential that you compare data from more than one run. This might be data from last session, or multiple runs from one day. Currently up to 10 runs maybe loaded into the software at once and compared directly.

- **Multiple laps.** Within each "run" there maybe a single stage, run or many laps – unlike other systems we do not limit the laps you can load.
- **Add virtual lap beacons.** Traditional "auto sport" systems require that you place a light beacon at the side of the track for performing track timing, however, because our systems use GPS this isn't required – to calculate lap times or sector times you simply add a virtual optical beacon or "track markers" to the track map and base your lap times and sector times on these. There is almost no limit to the number of track markers that you can add to a track map, in practice you can calculate as many sector times as you require.
- **Perform complex calculations.** Once you have added "track markers" to the track map these can be used as the basis of calculations to find minimums, maximums, averages even statistic functions of any variables. For example you can find the maximum speed or average throttle opening around a particular corner.
- **Automatically generate graphs.** Again, once you have added track markers to the track map you can use these as a basis for automatically generating graphs. For example you could automatically plot the speed down a selected straight of the fastest lap compared with the slowest lap to check your breaking point or gearshift points.
- **Save data to disk.** You can save either raw data to disk, or you can save your entire analysis including all the graphs and calculations that you have generated.
- **Print graphs and tables.** The software includes the facility to generate really high quality print outs of graphs, track maps, bar charts or tables.
- **Export data to a spreadsheet.** In some applications it can be useful to export data to a spreadsheet. This can be done in several ways – you can either export all the data from the run, or alternatively you can export the data for a table or individual graph. This facility can be particularly useful if you are including the data in a report.
- **Save/load multiple vehicle configurations.** Because our systems are so quick and simple to fit in a vehicle, it is common for them to find their way into various vehicles. To help in these applications we provide the facility to save and load various vehicle configurations, for quick reference.
- **Comprehensive data analysis options.** There are many options that allow you to process the data in the way you require. For example you can trim runs, filter data in a number of different ways and even select how power and distance are calculated.
- **User selectable variables.** There are many variables that are accessible in the software, but in most applications only some of the variables are of interest. To speed up the program operation you can select only the variables of interest.
- **User defined variables.** One of the most powerful features of the analysis software it the ability to add your own, user defined, variables. These have many applications; simple applications include converting an existing variable to different units, converting a voltage to a physical quantity such as a temperature, calculating the slip ratio between 2 wheels or shafts.
- **User defined graphs.** In a similar way to defining your own variables, you can also define your own graphs for quick reference. You can set up all you preferred options then just select the graph from this list.

Frequently Asked Questions

What is the difference between the Analysis software for the AP22/DL90/DL1/AX22?
All the Race Technology data logging products are supported by a single program "analysis.exe". When this program is run you must select which hardware the program is to be used with. Depending on the hardware selected the program has different data download methods, different variables available and in some cases different analysis options. For example, if AP22 is selected

then there are no analogue inputs. Nearly all the main features of the program such as graphing, virtual dashboards, user-defined variables etc. are available no matter which hardware is used.

What Video file formats are compatible with the software?

The software can import and decode any video format recognised by the windows media player version 9, this includes ." .mpg, .mpeg, .avi, .mov, .wav, .mp2, .wma, .wmv, .asf" files. Currently the software can only export ".avi" files.

What is the difference in the Analysis software for cars/bikes/boats/karts?

This is a very similar answer to "What is the difference in the Analysis software for the AP22/DL90/DL1/AX22?". When you run the data analysis program you have the option of selecting which vehicle type the system is used on. Depending on your choice, the programs options are tailored to suit. For example if the target vehicle is a boat then references to a trackside beacon are disabled.

What specification of computer is required to run the data analysis software?

In common with most windows applications there really isn't a minimum limit of machine that the program will run on, but clearly the more powerful the computer the faster the program will run. For good performance, we recommend a minimum of a 700Mhz processor and 64MB of RAM. For analysing runs of 30 minutes or more, 128MB or RAM is recommended. The other criteria to consider is the screen resolution, below 1024x768 it gets difficult to view the data on more than one graph at a time – it is certainly possible, but it isn't ideal.

How do I know if I have the most up-to-date version of the software?

The most up to date version of all Race Technology software is always available from our web site.

How do I get support for the Race Technology software?

We offer free lifetime support for all our products on email; we aim to respond to support questions within a few minutes for simple questions – a bit longer for more difficult issues. If you are having *particular* difficulties then in addition we offer limited telephone support for the first 6 months after purchase.

Please note: The full version of our analysis software, and some example data, is always available for download from our web site:

www.Race-Technology.com

So if you are interested in it's capabilities, then download it and try it for yourself. If you have any ideas for how the software could be further improved please contact us directly and we will make every effort to include your suggestions in future versions of the software.

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