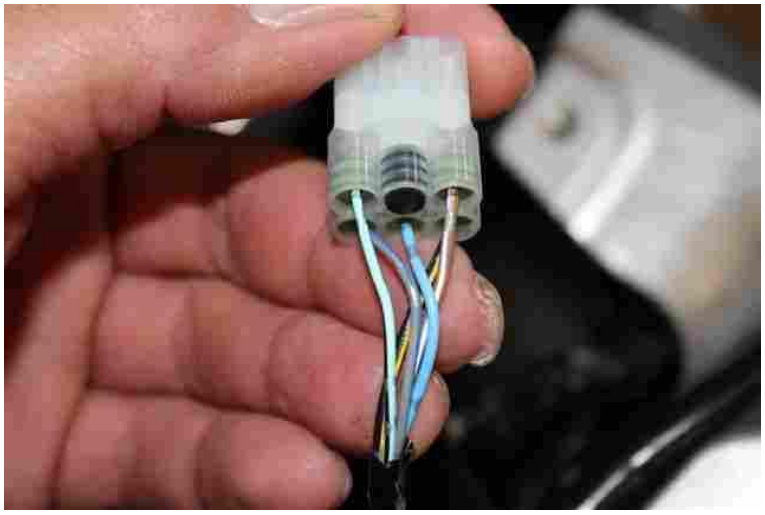
Installation:



Connecting to the Kawasaki ZX-10R's loom is very straightforward; the 2D KIT system is supplied with a ZX-10R-specific connector, which plugs into the diagnostic port at the back of the bike. This supplies power and communications to the logger, dash and GPS mouse.

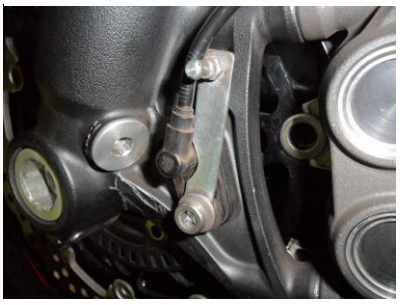
For the wheel speed sensor (supplied) you just have to make a small bracket, so that the Hall Effect sensor is mounted close to the disc bolts.

The rear suspension sensor that we recommend for the Kawasaki ZX-10R is a slim-line 75mm potentiometer, which fits through the small gap around the shock.

The MiniDash can either be mounted to a bracket attached to the air intake, or simply secured using Dual Lock.

The GPS mouse needs a view of the sky, and this can either be achieved by mounting on the motorcycle's tailpiece, or just behind the screen using Dual Lock.

Front suspension mounting points



Which channels do I have available on the diagnostic plug?

Simply by plugging into the bike, the following channels are available:

RPM
Throttle
Water Temp
Air Temp
Gear
Battery Voltage
Power Mode
Traction Control activation

This is in addition to the standard 2D GPS channels:

GPS Speed
GPS time
Course
Latitude
Longitude
Altitude
GPS Laptime

Sensors that can be added:

Front/ Rear Suspension
Front/ Rear Brake Pressure
Additional Wheel Speed Sensor
Air/ Fuel Lambda module (requires KIT system as minimum level)

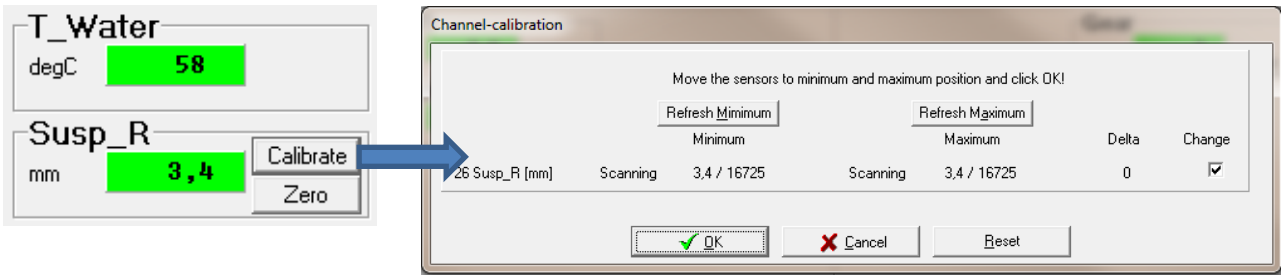
There are also optional extras such as:

- Big Dash (pictured)

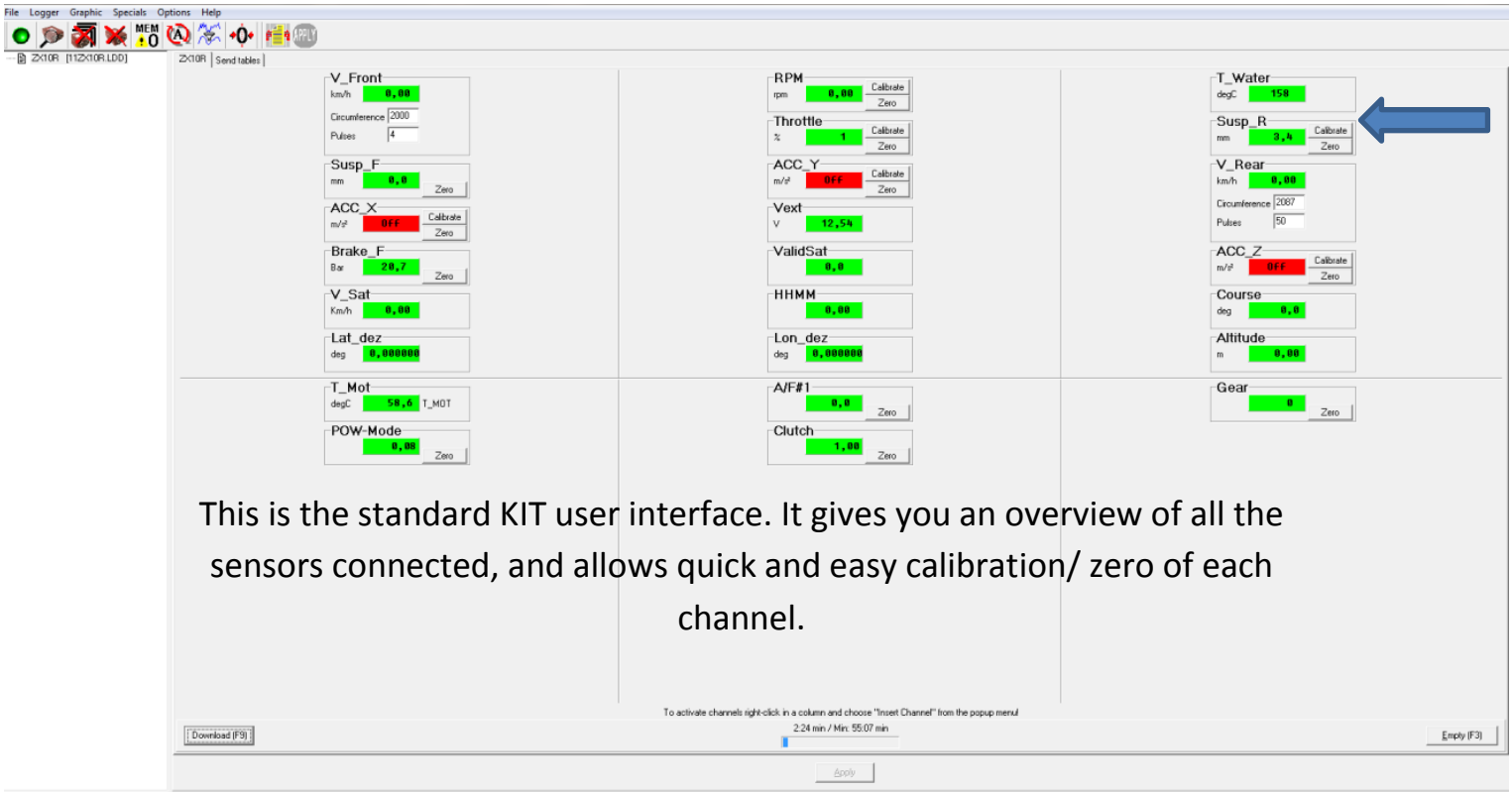
- Higher levels of software license which allow for more in-depth analysis.

How do I calibrate a channel?

The advantage of having the channels on the CAN bus (diagnostic port) of the motorcycle means that the majority of the sensors are automatically calibrated/ zeroed. The external sensors such as suspension and brake pressure are easy to configure using the 2D software.

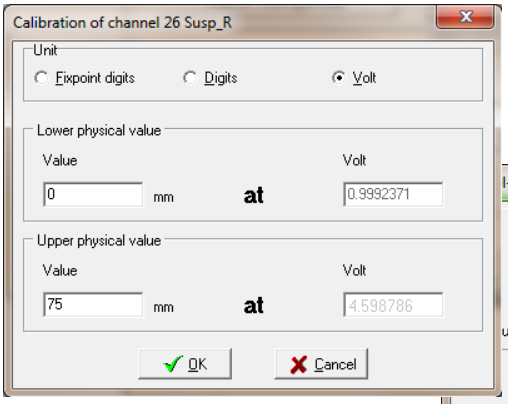


Calibration/ set up continued

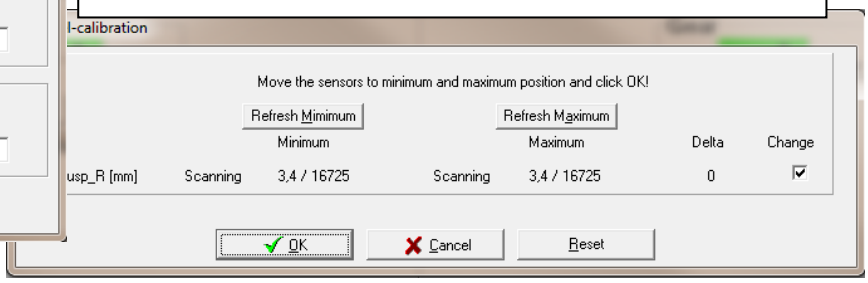


This is the standard KIT user interface. It gives you an overview of all the sensors connected, and allows quick and easy calibration/ zero of each channel.

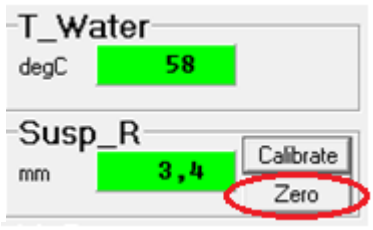
For example, to calibrate a 75mm rear suspension potentiometer, you would select the *Calibrate* tab next to the channel from the above screen. From there, the automatic mode means that the system will sample the minimum (fully out) and maximum (fully compressed) readings.



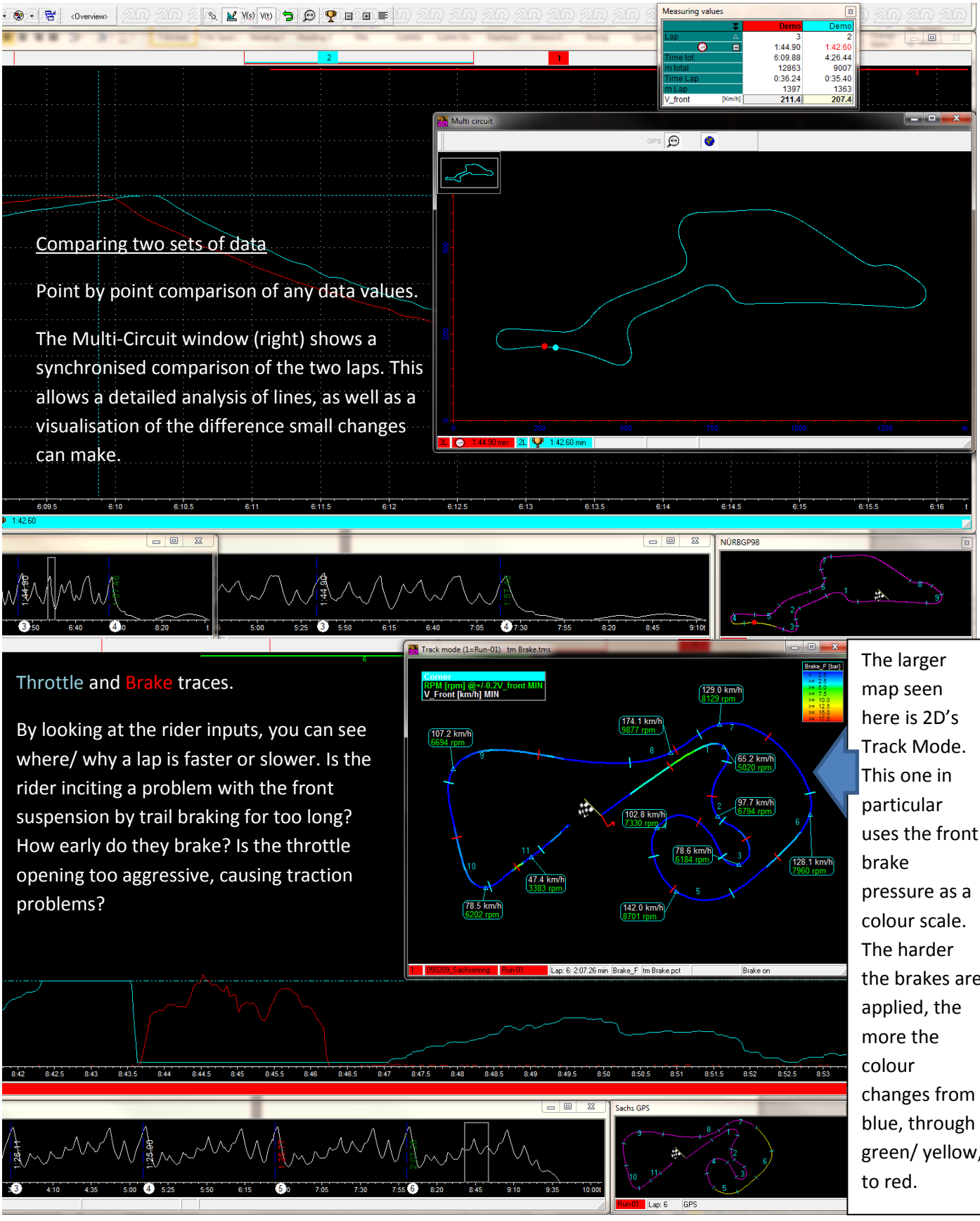
Once the system knows the **length of the sensor** and the voltage (most analogue sensors will typically be 0-5V), the calibration is complete.



To ZERO a channel, you need to decide where the zero point is. For suspension, a common zero point is when the load is taken where the wheel is off the ground. This way, as the data trace approaches zero, you know that the bike is about to wheelie or stoppie.



What does the data look like?



Comparing two sets of data

Point by point comparison of any data values.

The Multi-Circuit window (right) shows a synchronised comparison of the two laps. This allows a detailed analysis of lines, as well as a visualisation of the difference small changes can make.

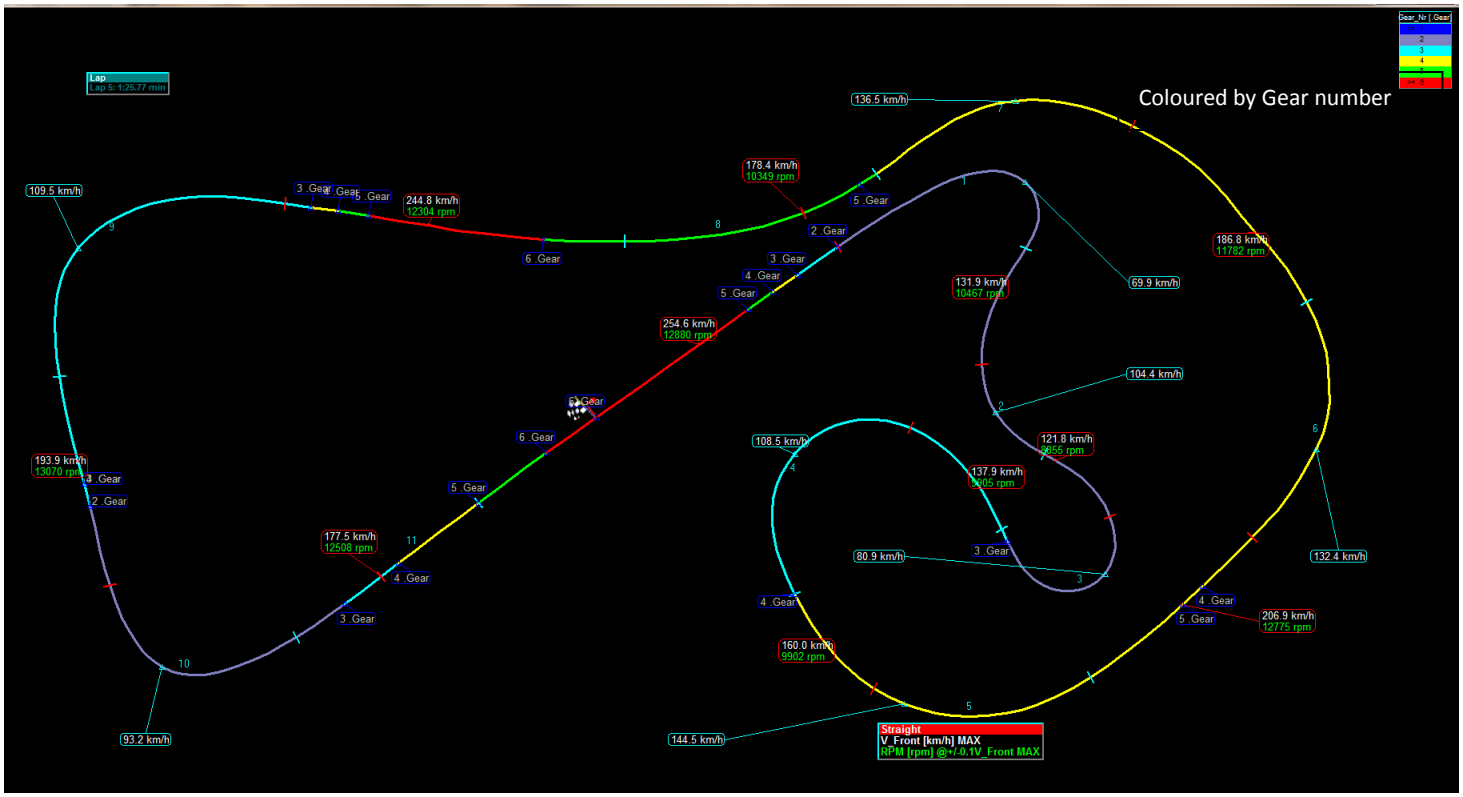
Throttle and Brake traces.

By looking at the rider inputs, you can see where/ why a lap is faster or slower. Is the rider inciting a problem with the front suspension by trail braking for too long? How early do they brake? Is the throttle opening too aggressive, causing traction problems?

The larger map seen here is 2D's Track Mode. This one in particular uses the front brake pressure as a colour scale. The harder the brakes are applied, the more the colour changes from blue, through green/ yellow, to red.

Track Mode

This is another example of Track Mode, this time coloured by Gear number. These maps are easily printable for a rider/ engineer's quick reference or annotation. A popular way of getting a rider's feedback is to get them to annotate a circuit map, with gear numbers and general comments. Using 2D generated track map means it is objective, the maximum speeds/ RPM are already there, and they are easily comparable between sessions/ riders.



Min/ Max tables

Using these pre-configured tables allows a very quick and easy way of checking to see if suspension working ranges are being reached, if temperatures are too high/ low, braking pressures too high/ low, or RPM ceiling being reached. These values are also arranged by lap.

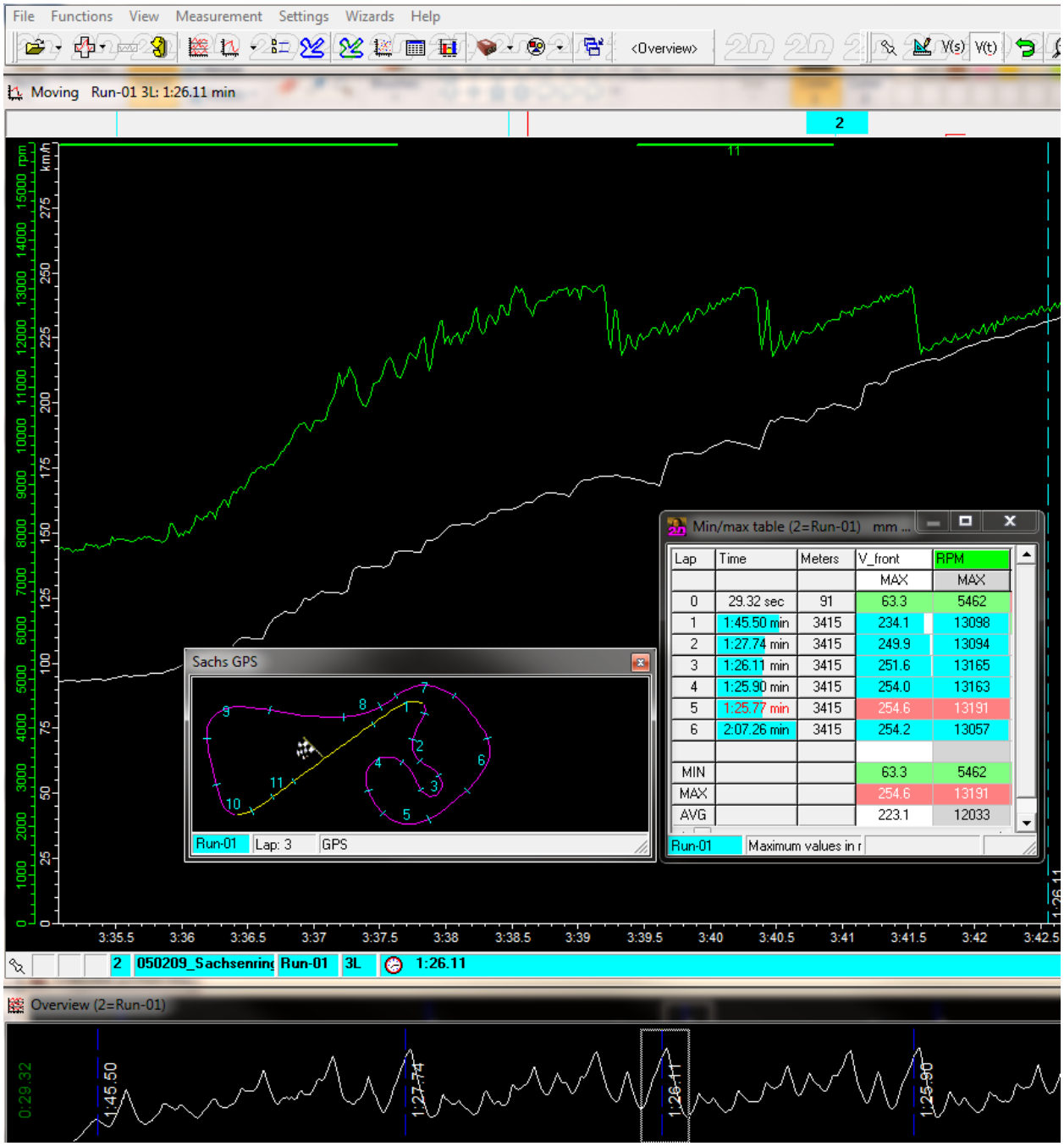
Min/max table (1=Run-01) mm Overall.mms

Lap	Time	Meters	V_front	RPM	Susp_F		Susp_R		T_Mot	T_Water	Vext	
			MAX	MAX	MIN	MAX	MIN	MAX	MAX	MAX	MIN	MAX
0	29.32 sec	91	63.3	5462	12.8	35.6	4.6	16.9	63.3	63.3	10.4	14.0
1	1:45.50 min	3405	234.1	13098	0.0	113.0	0.0	29.5	58.0	58.0	13.7	14.0
2	1:27.74 min	3415	249.9	13094	0.0	105.7	0.0	33.2	62.7	62.7	13.7	14.0
3	1:26.11 min	3416	251.6	13165	0.0	110.7	0.0	34.4	65.9	65.9	13.7	14.0
4	1:25.90 min	3417	254.0	13163	0.0	106.8	0.0	42.1	68.2	68.2	13.7	14.0
5	1:25.77 min	3422	254.6	13191	0.0	106.7	0.0	37.6	69.1	69.1	13.7	14.0
6	2:07.26 min	3346	254.2	13057	0.0	106.6	0.1	33.8	69.1	69.1	10.7	14.0
MIN			63.3	5462	0.0	35.6	0.0	16.9	58.0	58.0	10.4	14.0
MAX			254.6	13191	12.8	113.0	4.6	42.1	69.1	69.1	13.7	14.0
AVG			223.1	12033	1.8	97.9	0.7	32.5	65.2	65.2	12.8	14.0

Run-01 | Maximum values in measurement

Gearing Analysis

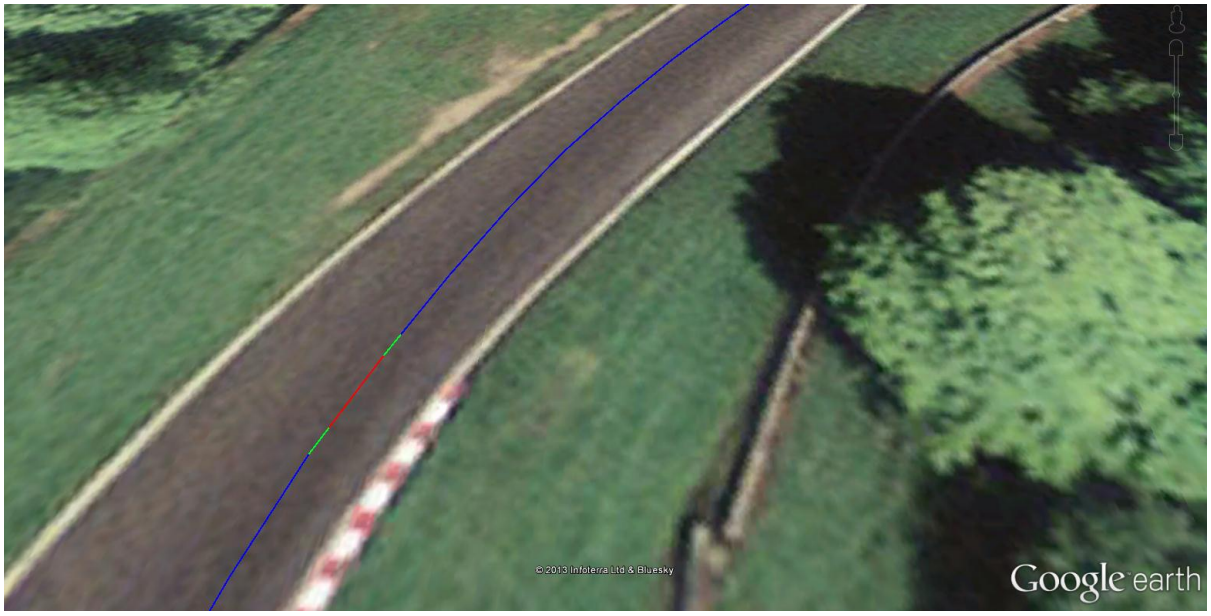
Below is a screenshot showing RPM and front wheel speed. The yellow section on the map shows the section of circuit that is currently displayed in the main window. The min/ max table is for lap reference, to see if a high RPM happened just once or multiple times.



Special ZX-10R Features

The ZX-10R allows for recording of **Traction Control Activation** as standard.

Using the Google Earth function of the 2D Analysis package, it is possible to colour map the circuit by TC activation. This allows very quick identification of when/ where/ how long TC activation occurs.



Clutch activation

This shows you where/ how long the clutch is activated for. In the trace below, you can see the clutch being pulled in twice.