FUNCTIONALITY
SOFTWARE SET-UP MOTORBIKE SIMULATOR

The software SET-UP Motorbike Simulator has multiple functionalities, below we will show you the main uses of the software.

First of all, the software allows you to import the data acquired from the acquisition system, and thanks to these to calculate:

- engine power curve, that can be calibrated modifying the value of the drag coefficient;
- trajectory executed (if the acquired data also includes the angle of inclination of the motorbike with respect to its vertical axis, the software also estimates the transversal slopes of the track;
- grip coefficient provided from the tyres (it isn't the simple ratio between force provided and vertical force, but in the calculation is taken account of the grip variation in function of the contact pressure act on the tyre in the different conditions).

With the data acquired, combined with the technical features of the motorbike and of the tyres, the software SET-UP Motorbike Simulator carries out a dynamic calculation that allows you to analyze:

- the behavior of the tires in the session in question, in fact, in addition to calculating the level of grip provided, allows us to see how the available lateral and longitudinal grip was exploited at every point of the track, both at the front and at the rear;
- the behavior of the motorbike, estimating the slip angles and the slip ratio of the tires at every point on the track;
- the trend of tire temperatures at each point of the track for the three main areas of the tread (left side, centre, and right side), both at the front and at the rear.

Finally, if the technical features of the fork, of the rear suspension, and of the shock absorber, are entered, the software SET-UP Motorbike Simulator, based on the centrifugal force and on the traction or braking forces, applied, simulates:

- front suspension operation;
- rear suspension operation;
- balance variation.

The software then calculates how the loads acting on the wheels vary at each point of the track, in function of the behavior of the suspensions. Taking as reference the loads with the suspensions supposedly rigid, the software is therefore able to evaluate how the loads available at the front and rear change with the different suspension setting, and therefore to estimate how can improve, or worsen , the performance, at each point of the track.

Therefore, by fixing a starting suspension set-up, and the data acquired as reference for the rider's driving style, it will be possible to test the effects of other suspensions setting on the performance.

In addition to the features shown above, that use the acquired data, the software SET-UP Motorcycle Simulator can also be used as a simulator. In fact, using the features of the motorbike, of the engine and gearbox, and of the tyres, the software simulates the performance that a virtual rider can obtain.

This functionality can be leveraged to:

- compare solutions by varying the basic balance of the motorbike, the engine power curve, the gear ratios, or the final drive ratio;
- compare different suspensions setting, keeping fixed all the other features and the rider's driving style.

In summary, therefore, the software SET-UP Motorbike Simulator can be of great help both in the development phase of the motorbike or of the engine, to identify the main features that allow to obtain the best performance, and in the setting phase, to identify for example the most suitable gear ratios for each track, and above all the optimal suspension set-up.