



To: All Customers

From: Chris Osetek – General/Technical Manager

Date: October 2017

Subject: New System Announcement- Implementation of Real-Time Data Acquisition System

We continue to evaluate our customers' suggestions for improvements and implement those which provide more useful data and increased productivity. Over the last year and a half we have been designing and testing this new data acquisition system along with supporting procedures

The Real-Time, or Continuous Motion, system allows teams to collect data while the vehicle is sweeping through a range of motion. There are currently two different modes of testing with this system.

Operation Mode 1: Yaw

During the Yaw operating mode the computer will move the vehicle at a constant velocity in yaw, continuously sampling data at a synchronized 1000 Hz. This can be done in either direction, ranging from -5° to $+3^{\circ}$ or $+3^{\circ}$ to -5° . There will be data clipping at the beginning and ending of the yaw sweep as the yaw table accelerates to its target constant velocity.

Operation Mode 2: Ride Height

During the Ride Height operating mode the vehicle can Heave, Pitch, or Roll and take data continuously throughout the movement. Unlike Yaw, the teams will need to give starting and ending ride heights for the operator to drive to. When utilizing the Ride Height operation mode **you must always start at the lower ride height and move upward.**

System Features:

- Seamlessly switches between current steady state testing and the new Real-Time data collection
- Collects Real-Time CD, CL, CLF, CLR, CS, CYM, CPM and CRM
- Outputs data in .tdms format. Automatically exported into customer folder for each run
 - This will require a .tdms plugin for Excel to open: [Click Here to download](#)
- Data samples at 1000 Hz for 16 seconds for each sweep
- Front mounted laser. Typical mounting location is exterior mount center of front splitter
- Raw data and real-time data is automatically output to the customer folder

Test Modes:

- Yaw Sweep
 - Sweep - 5° to +3° or +3° to -5°
 - Data collected through the sweep at constant yaw velocity
- Ride Height
 - Heave
 - Pitch
 - Roll
 - All ride height sweeps start at the low height and move up to achieve the range of heave, pitch or roll

Actions / Info needed in order to test, using this system:

- Let operator know which test mode (Yaw and / or ride height)
- For Yaw sweep, operator needs to know which direction to sweep (-5 to +3 or +3 to -5).
 - Also needs to know which height to sweep at
- For ride height testing the front laser needs to be installed on car.
 - Also need to make accommodations for laser wire to be routed.
- Customer must provide laser mount, typically mounted center of front fascia.
 - Laser is a Micro-epsilon optoNCDT ILD1420-200(001).
 - [Click here for mounting info.](#)
- For a Ride height sweep, the operator will need to know starting height, ending height, and sweep direction (heave, roll or pitch)

Summary:

This new independent data collections system allows a different approach to race car aero development. There is a large amount of data that is collected and outputted to the team in a short sixteen second collection time, the challenge is how to use and make sense of this new tool. Please let us know if you have any questions about this new system.

Sincerely,

Chris Osetek – General/Technical Manager

cosetek@aerodynwindtunnel.com

704-264-6304