



CASE STUDY

PIT LANE TO START LINE IN NO TIME

THE APPLICATION

The T24 wireless telemetry sensor technology was used in conjunction with **Novatech**, an established load cell manufacturer and **Vishay Precision Group**, recognised worldwide for the quality of their in-house strain gauges, to provide motorsport teams with a tool that allows quick and repeatable car set-up preparation by combining all tests required.



KEY BENEFITS

- ▶ T24 wireless telemetry technology saves race engineers valuable time by allowing them to obtain extensive information on the dynamics of the car from a single procedure.
- ▶ Provides an accurate indication of centre of gravity to help teams optimise vehicle performance for track conditions.
- ▶ Removes the need to refit wheels and place vehicle on corner scales.



THE PROJECT: WIRELESS TELEMETRY SAVES RACE ENGINEERS VALUABLE TIME IN VEHICLE SET UP

THE APPLICATION

British load cell manufacturer Novatech spotted the potential for improving the process of measuring centre of gravity and other dynamics for the optimum set up on racing cars. To achieve this, the company developed a wireless wheel set up system using Mantracourt's T24 wireless system.

THE CHALLENGE

Motor racing teams needed a more convenient way of taking centre of gravity measurements prior to competitions.

Previously, F1 teams needed to walk around the car to take readings from a handheld display from each individual wheel, which added a lot of time to the process. With the increasing complication of vehicles the testing requirements have also increased. This brought the need for optimisation of existing processes.

Teams wanted to be able to complete a maximum number of measurements without refitting the wheels of the vehicle.

THE SOLUTION

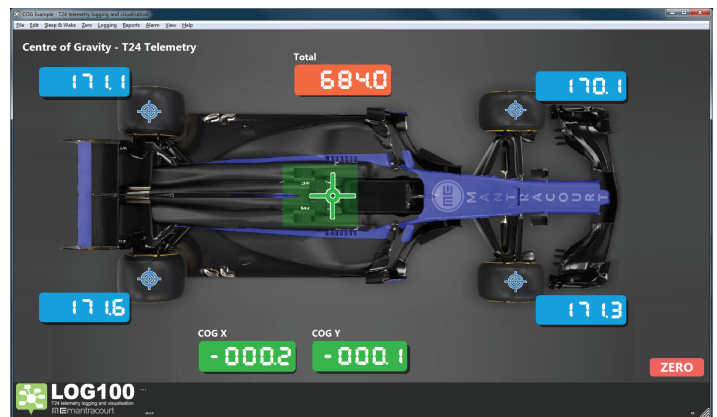
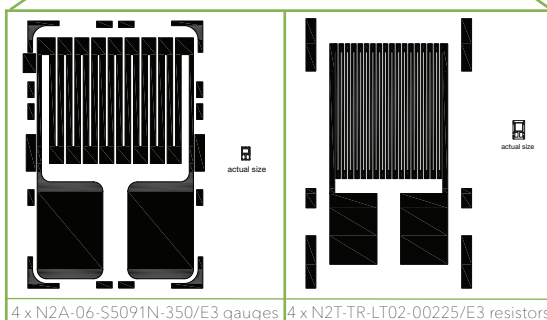
With Novatech's set up wheel, teams are able to remove the wheels of the vehicle and quickly use the company's set up wheel load cell, which utilises ball transfer bases to allow the car to be moved easily around the workshop. This is not the only benefit brought by the set up wheel. The ball base also serves as a single point of contact, maintained when the set-up frame is tilted. This results in the load cell returning less than 0.25% total error for camber angles up to 3° from vertical.

When combined with Mantracourt's T24 Wireless Telemetry System and LOG100 software, the set-up wheel package allows the user to continue to work uninterrupted on the set-up of the car whilst monitoring and logging individual corner weights and various groups, in real-time, using a built in centre of gravity maths calculation.

The LOG100 software allows the user to create their own graphical user interface and individual data channels can be summed or otherwise manipulated to give front/rear bias, left/right bias, cross-corners (diagonal biases) and the centre of gravity position can be visualised either as an exact percentage from a given position (front/rear and left/right) or by using a colour coded bar graphic from the theoretical centre point. Data transmission is via license free 2.4GHz. ID tagging system implemented during synchronisation between transmitters and base stations and ability to set configuration PINs are in place to ensure that the transmission is secure.



MICRO
MEASUREMENTS
A VPG Brand





THE RESULTS: WIRELESS TELEMETRY SAVES RACE ENGINEERS VALUABLE TIME IN VEHICLE SET UP

THE RESULTS

The complete package of set-up wheel loadcells from Novatech and wireless telemetry from Mantracourt provides the user with a simple to use system that is both extremely accurate and highly efficient.

Teams can implement changes to ride height, toe and camber angles and make adjustments to weight distribution without the need to continuously raise and lower the car or circle around the car taking individual readings.

Due to the 'many to one' functionality of the T24 system, a single workstation can be used to monitor multiple car set-ups.

The integrity of the measurements is guaranteed by the eight gauge bridge that self compensates for off axis forces. It is assembled using Micro-Measurements foil strain gauges and modulus resistors made by Vishay Precision Group.

The supplier has been selected for its unrivalled quality.

MANTRACOURT PRODUCTS USED

A complete system for one car consists of four T24-ACMI-SA Wireless Transmitter per set-up wheel frame and one T24-BSu Wireless USB Base Station per workstation, which enables PC connection.



T24-ACMI-SA

2.4 GHz Strain Acquisition Module



T24-BSu

USB base station

NOVATECH PRODUCTS USED

Novatech's set-up wheel loadcells are special variants of their popular F256 design, fitted with ball transfer bases and with axial cable exits through the M12 mounting stud.



F256 Load Cell

- Capacity of 500kg
- Less than 0.25% total error for camber angles up to 3° from vertical
- Self-compensation for off-axis forces

VISHAY PRECISION GROUP PRODUCTS USED

8 gauge bridge of foil strain gauges from Micro-Measurements, who are part of the Vishay Precision Group.

- 4 N2A-06-S5091N-350/E3 gauges
- 4 N2T-TR-LT02-00225/E3 modulus resistors

