

# Wyer Clinotronic PLUS Digital Inclinometers



**BOWERS GROUP**

Case Study - September 2016



**Company Name**  
**Location**  
**Product Installed**

**Carlin Motorsport**  
**Farnham, Surrey, UK**  
**WYLER Clinotronic PLUS**  
**Digital Inclinometers**

**Industry**  
**Component Type**

**Motorsport**  
**Levelling**

## APPLICATION BACKGROUND

Based in Surrey, Carlin is one of the largest professional motor racing teams outside Formula 1, with race experience in a variety of championships including British F3, Porsche Supercup, World Series by Nissan, Formula Renault 3.5, A1GP, FIA Formula 3 European Championship, GP3 Series and GP2 Series. Some of today's most successful drivers have passed through the doors of Carlin, with famous names including F1 drivers Sebastian Vettel, Daniel Ricciardo, Kevin Magnussen and Daniil Kvyat.

## CHALLENGE

Carlin Motorsport was looking for an easy to use and highly accurate method of measurement for the set-up and maintenance of its motorsport cars.



## SOLUTION

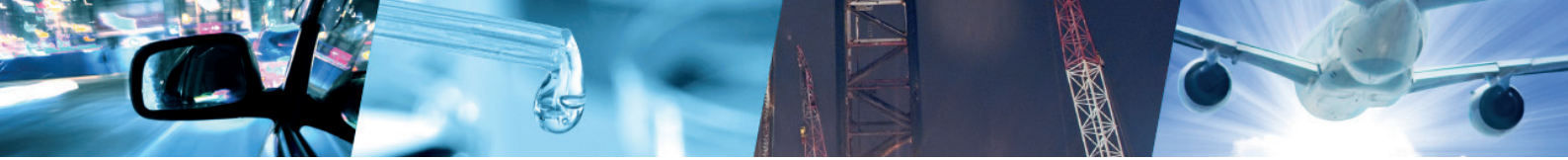
Bowers Group supplied Carlin with several WYLER Clinotronic PLUS Digital Inclinometers which are used in the workshop, garage, and at the track.

The WYLER Clinotronic PLUS is a robust shop-floor proof digital inclinometer with 4 machined faces, permitting the measurement of angles through 360°. Its 3 button operation and high visibility display allows easy access to operating modes including absolute and relative modes.

Carlin engineers regularly use WYLER Clinotronic PLUS inclinometers at racetracks in locations across the world, and up to 30 minutes before the cars go out on track.

The inclinometers are used in the workshop on a daily basis for setting up surface tables. In this instance, the inclinometer is used in its absolute function to check that the surface table is level before work on the car commences. It is then used on various parts of the vehicle whilst the car is mounted on the surface table.

Several important criteria are measured using the inclinometer. Machined areas on the chassis are used as a reference point, where the inclinometer is set to its relative function in order to act as a guide for relative measurements.



The relative function is also used to set the angles of the wings in relation to the chassis.

The steering is checked; Carlin engineers set the inclinometer relative to the chassis and then place it on top of the steering wheel to set the angle to zero. The camber and caster of the wheels are also checked, ensuring the correct wheel alignment of the vehicles.

Carlin engineers use the Clinotronic inclinometer at the race track to establish a level patch for any adjustments and maintenance to vehicles as required. In this instance, it is used in its absolute function to ensure that the patch is completely flat. If a car crashes, or if a driver is struggling with a set up issue and the car needs to be adjusted, the patch can be used as a level base to ensure all measurements are accurate.

Carlin also uses a Clinotronic inclinometer to set up scale versions of cars in their offsite wind tunnel, allowing engineers to measure the downforce and drag of the car in a controlled environment.

#### COMMENT

F3 Chief Mechanic Ian Grant said: "The Clinotronic is very versatile; we use it in a variety of ways both in the set up garage and out on the circuit. For such a small piece of kit it is actually very important! It's obviously absolutely vital that the guys have the cars set up perfectly. Any discrepancies with regard to angles on various parts of the car can affect speed and the efficiency of the braking system, so the inclinometer is an incredibly important tool for us. We rely heavily on it and place our trust in it.

The WYLER is used a bit more on F3 vehicles than other teams. This is because a lot of the other teams have a fixed wing angle requirement, as well as various standard measurements that need to be met. F3, on the other hand, is a championship where we have the flexibility to make more of our own components. For example, we are allowed to set our own angles for the front wheel blanks and the rear wings. Over a race weekend, the inclinometer is used to check that these have remained at a consistent level."



F3 Engineer at Carlin, Jimmy Goodwin added: "The Clinotronic PLUS is very accurate. We've been using it since 2000; it's been used on every car that has won a race that we've competed in; which includes, to date; 329 wins and 814 podiums!"

