



**CEMB**

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**INNOVATIONS**

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# CEMB INNOVATIONS

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Over the years CEMB has built a highly qualified and experienced technical team working to seek innovative and high-technical solutions to anticipate market requirements. An innovative product is synonymous of quality and customer orientation, an aspect that has always guided all employees who constantly develop new projects with passion.

Each project is followed internally step-by-step with the aid of sophisticated data processing systems: from the analysis of the characteristics to the definition of the specifications, from the implementation of a prototype to the performance tests, thus offering highly innovative technical characteristics that complement and emphasize the technical experiences in the field of vibration analysis that have characterized CEMB for 70 years.





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# Virtual Sonar



## WHAT IS IT?

**Virtual Sonar** is the software that enables, in absence of a sonar device, to detect the width of steel rims without having to enter them in manually.



With the detection of distance and diameter of the first plane obtained with the automatic gauge, **Virtual Sonar** calculates all the possible offsets and rim width combinations in which the second correction plane could be.



The second correction plane range is accurately calculated on hundreds of thousands of rims, allowing 95% of the wheels to be measured.

**PERFORMANCES ARE COMPARABLE TO THE ONES OF A WHEEL BALANCER WITH SONAR, AT A COMPETITIVE PRICE.**



## HOW DOES IT WORK?



### 1<sup>ST</sup> STEP

Detect the 1<sup>st</sup> plane with the automatic gauge.



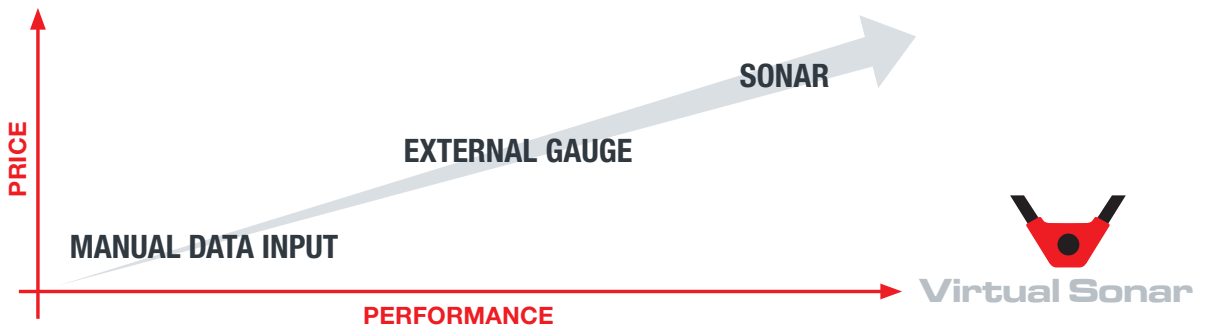
### 2<sup>ND</sup> STEP

Close the wheel guard to initiate the spin as on balancers with Sonar. **Virtual Sonar** will automatically calculate the position of 2<sup>nd</sup> plane.



## WHAT ARE THE ADVANTAGES?

**Virtual Sonar** allows an entry-level balancer, to have the features of a Sonar machine. Reduces balancing time by avoiding operator errors caused by manual data entries and guarantees, at the same time, a balancing efficiency comparable to top of the range machines at a competitive price.



## MODELS EQUIPPED WITH VIRTUAL SONAR



ER60 PRO



ER15



ER10 PRO



ER10

# 3D Laser Scan



## WHAT IS IT?

**3D Laser Scan** is the touchless wheel distance and diameter measuring system which detects with high precision the dimensions of any rim profile, without any intervention of the operator.



During the correction phase, the **3D Laser Scan** pinpoints the exact position for stick-on weights application inside the rim. Any possible error during the weight positioning is avoided thanks to the electric brake, which locks the wheel into the exact correction position.

# LASER SCAN

**3D LASER SCAN, COMBINED WITH THE WIDTH SONAR OR EXTERNAL LASER, DETECTS WHEEL DISTANCE AND DIAMETER COMPLETELY AUTOMATICALLY.**





## HOW DOES IT WORK?

The first step of a balancing procedure, is the acquisition of the wheel dimensions: distance (from a point of reference on the balancing machine to the weight positioning point on the rim), diameter and width of the rim.

On standard balancers the first two measurements are usually made using a specific gauge, while the third can be acquired either by manual data input, virtual sonar, external gauge or sonar. On balancing machines equipped with **3D Laser Scan**, the measurement of these dimensions takes place automatically and in a few seconds.



## WHAT ARE THE ADVANTAGES?

**3D Laser Scan** is based on an advanced technology completely developed in-house specifically for the needs of the balancing applications granting many advantages:

- Fast and accurate reading of rim dimensions, even in case of complex profiles
- Bright laser for a more visible indication of the stick-on weights correction point
- Greatest robustness for a long lasting usage and no exposed moving parts, reducing the risks of damages
- Smaller dimensions
- Easy maintenance and cleaning

## MODELS EQUIPPED WITH 3D LASER SCAN



ER100 EVO



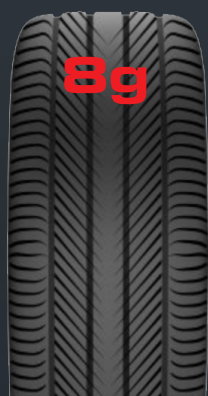
ER90 EVO

# Auto Adaptive Mode

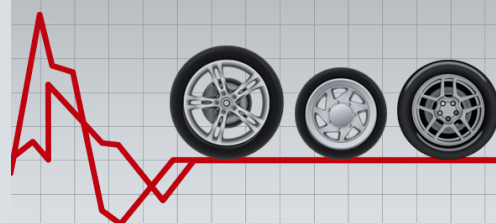


## WHAT IS IT?

**AutoAdaptive Mode** is the innovative tolerance calculation system that, for each wheel detects weight and dimensions and calculates the tolerance value that will cancel any vibration perceived on the steering wheel.



**AUTOADAPTIVE RECALCULATES THE RESIDUAL IMBALANCE MAKING SURE IT REMAINS WITHIN LIMITS ASSURING A SMOOTH RIDE.**



## MODELS EQUIPPED WITH AUTO ADAPTIVE MODE



ER100 EVO



ER90 EVO



ER70 EVO  
ER70SE EVO



ER85 EVO



## HOW DOES IT WORK?

With traditional wheel balancing, a wheel is considered balanced when the residual imbalance is less than 5 gr per plane, independently from the wheel dimensions and weight. This value is defined by the technical limitations and approximations and not by the method accuracy.

**BUT** the vibration a driver feels when driving, considering any imbalance, also depends from the wheel's weight and shape.

The heavier the wheel is the less a residual imbalance will be perceived by the driver. On the other hand, with a lighter wheel, even with a minimal residual imbalance, the driver will feel vibrations on the steering wheel.



## WHAT ARE THE ADVANTAGES?

**AutoAdaptive** allows you to cancel any vibration perceived on the steering wheel, granting the highest levels of comfort when driving, and together with the OPB Program, saves balancing time.



ER80 EVO  
ER80SE EVO



ER60 PRO



ER15



ER10 PRO



ER10

# One Plane Balancing (OPB)



## WHAT IS IT?

Vibrations produced by a wheel are caused by two kind of imbalances.



STATIC IMBALANCE

=



DYNAMIC IMBALANCE

COUPLE IMBALANCE

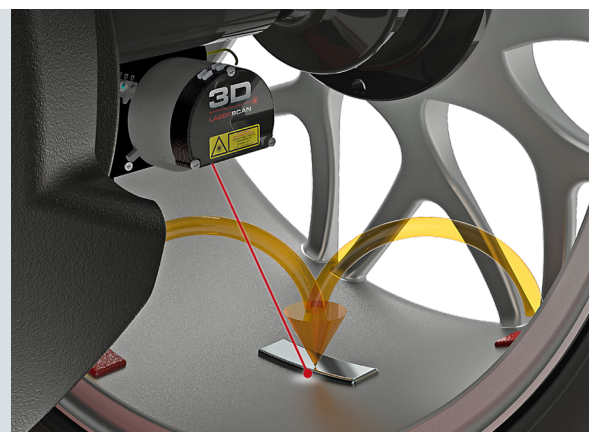


Dynamic imbalance is the one actually perceived when driving and the correction is done by positioning two counterweights, one for each plane.

**HOWEVER** static unbalance is the source of most vibrations felt by the driver. Why not balancing only the static, keeping the dynamic unbalance in tolerance and saving time using only one counterweight?

On the current wheel balancers, even if it is possible to balance only the static, it is very difficult not to increase the residual dynamic imbalance because: even if the angular position of the static is clear, the exact point along the rim is unknown and the residual dynamic (couple) can be out of tolerance which results in a loss of time and counterweights.

**THE SOLUTION IS THE OPB PROGRAM THAT CAN CANCEL STATIC IMBALANCE MINIMIZING AT THE SAME TIME THE RESIDUAL DYNAMIC VALUE.**





## HOW DOES IT WORK?

Within the right conditions, at the end of the spin, **One Plane Balancing** is automatically activated and suggests a single ideal correction plane, indicating the exact point inside the rim where it is possible to balance the wheel minimizing both static and dynamic imbalance, using only one counterweight.

**ONE PLANE  
ONE WEIGHT  
HALF TIME**



## WHAT ARE THE ADVANTAGES?

**40%** of the balancing time saved per wheel

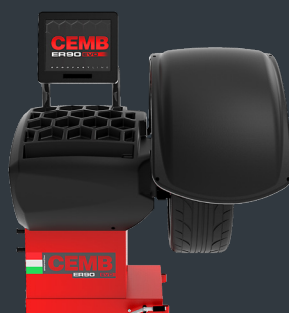
**70%** of wheels can be balanced with one weight only

**48h** working hours saved per year

## MODELS EQUIPPED WITH OPB



ER100 EVO



ER90 EVO



ER70 EVO  
ER70SE EVO



ER85 EVO

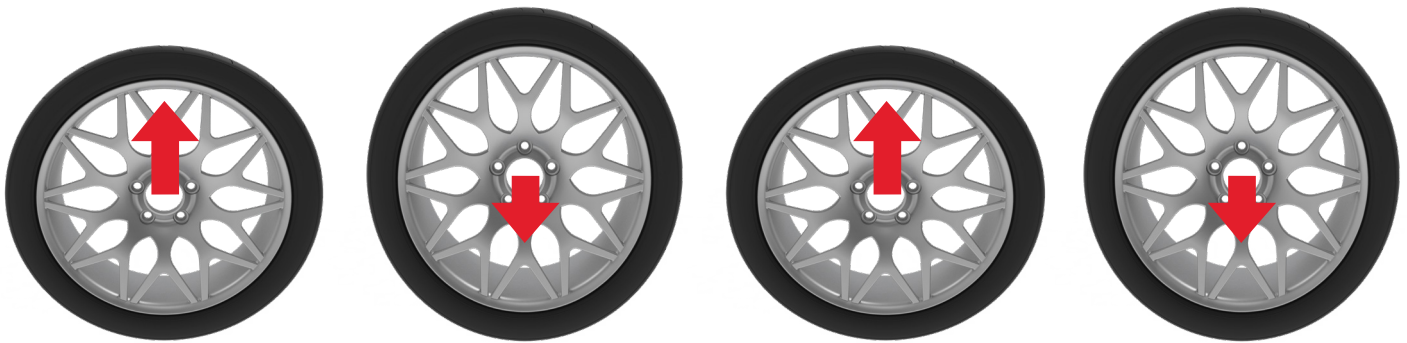


ER80 EVO  
ER80SE EVO



## WHAT IS IT?

**HubMatch** is an innovative software that displays and guides the operator on how to mount the wheel on the vehicle minimizing effects of tyre eccentricity.



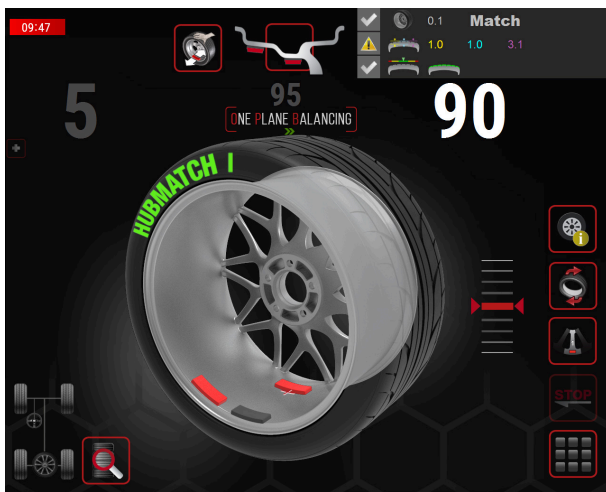
**HUBMATCH COMBINES REFINED OFF-CAR BALANCING CAPABILITIES AND FEATURES WITH A GUIDED ON-CAR ECCENTRICITY CANCELLATION PROCESS.**





## HOW DOES IT WORK?

Balancing process often does not solve all wheel vibration problems. Wheels must be balanced and also be “round when rolling on the vehicle”, i.e. cannot have high values of eccentricity, in order to be sure that the vehicle moves without annoying vibrations. In one single spin, **HubMatch** detects the highest point of the wheel (1st harmonics), and displays it on-screen to enable mounting of wheel on the vehicle so when positioning the rim on the hub it reduces the assembly eccentricity, up to 0,2mm, using just the hub bore and gravity. Simply matching mechanical clearances when positioning the rim on the hub will eliminate the eccentricity.



## WHAT ARE THE ADVANTAGES?

Solves all vibration problems on wheels, **HubMatch** guides the operator during the process, significantly reduces floor-floor cycle time and provides an improved ride quality.

## MODELS EQUIPPED WITH HUBMATCH



ER100 EVO



ER90 EVO



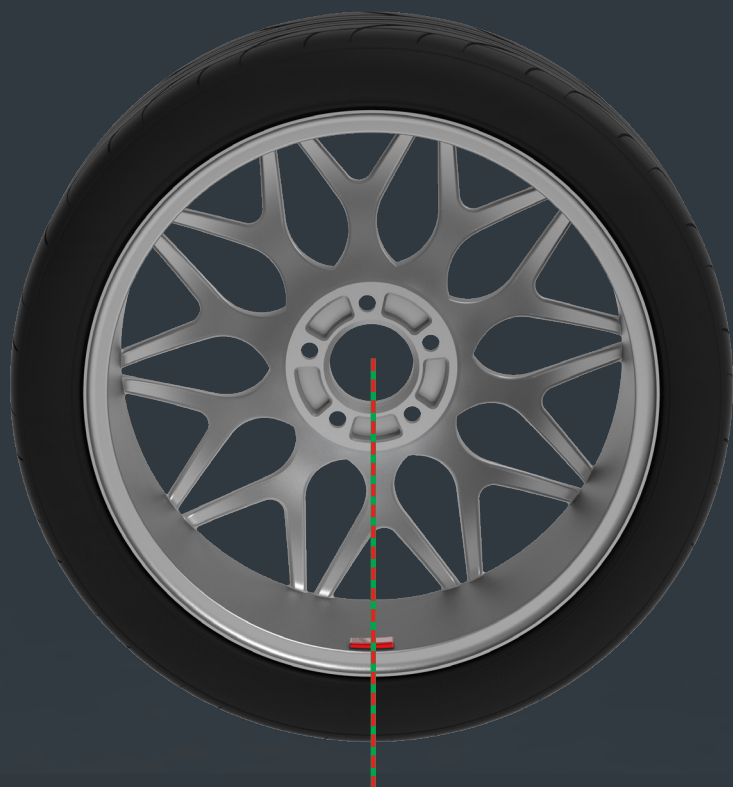
ER70 EVO  
ER70SE EVO

Only if equipped with optional EMS



ER85 EVO

# Automatic Positioning



## WHAT IS IT?

**Automatic Positioning** system, supported by the electromagnetic brake added on the DC motor, allows the wheel to position itself very quickly in the correction position.

**Automatic positioning** is found mainly on high range wheel balancers due to the cost of the brake.

## HOW DOES IT WORK?

At the end of the measuring spin the wheel stops automatically at the exact point of counterweight application. After correcting the first plane, by pressing “start” the wheel position itself accurately on the second correction point.



## WHAT ARE THE ADVANTAGES?

**Automatic Positioning** system with electromagnetic brake grants extremely fast positioning speed and the immediate locking of the wheel in the exact correction point.

## MODELS EQUIPPED WITH AUTOMATIC POSITIONING



ER100 EVO



ER90 EVO



ER70 EVO  
ER70SE EVO

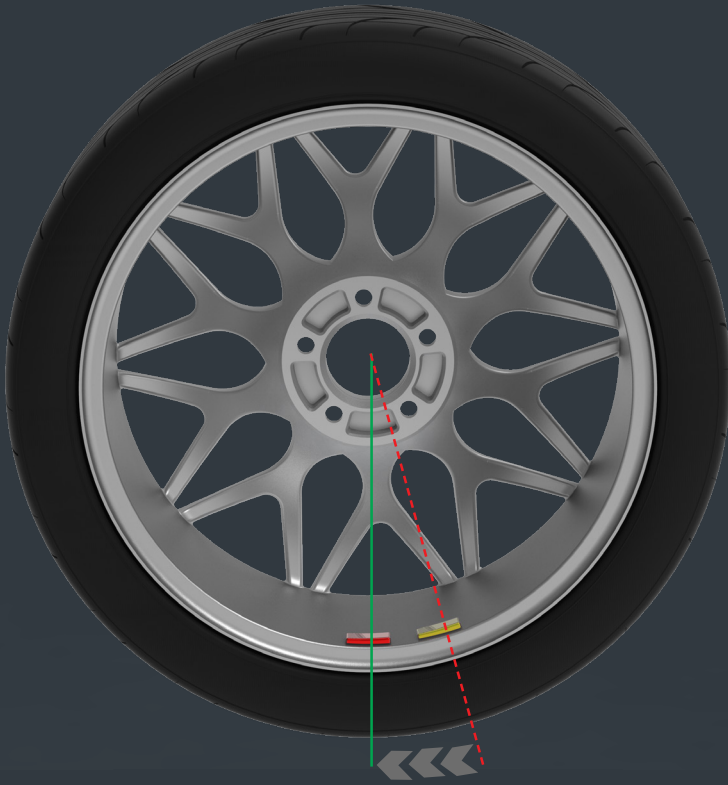


ER85 EVO

# Automatic Approach

## WHAT IS IT?

**Automatic Approach** system allows to stops in the proximity of the correction point. This system has been introduced to facilitate and speed up the balancing procedure on mid and low range balancers.



## HOW DOES IT WORK?

Once the measuring spin is completed, the wheel automatically stops around 15° from the exact point of application of the counterweight, allowing the operator to position it correctly with a little movement.

After the first plane is corrected, pressing “start” the wheel position itself around the second correction point.



## WHAT ARE THE ADVANTAGES?

**Automatic Approach** grants a faster balancing process by stopping in the proximity of the correction point allowing, with a simple gesture to position the wheel in the precise spot required for weight placement.

## MODELS EQUIPPED WITH AUTOMATIC APPROACH



ER80 EVO  
ER80SE EVO



ER60 PRO



ER65  
ER65SE



ER63  
ER63SE



ER15



ER10 PRO



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