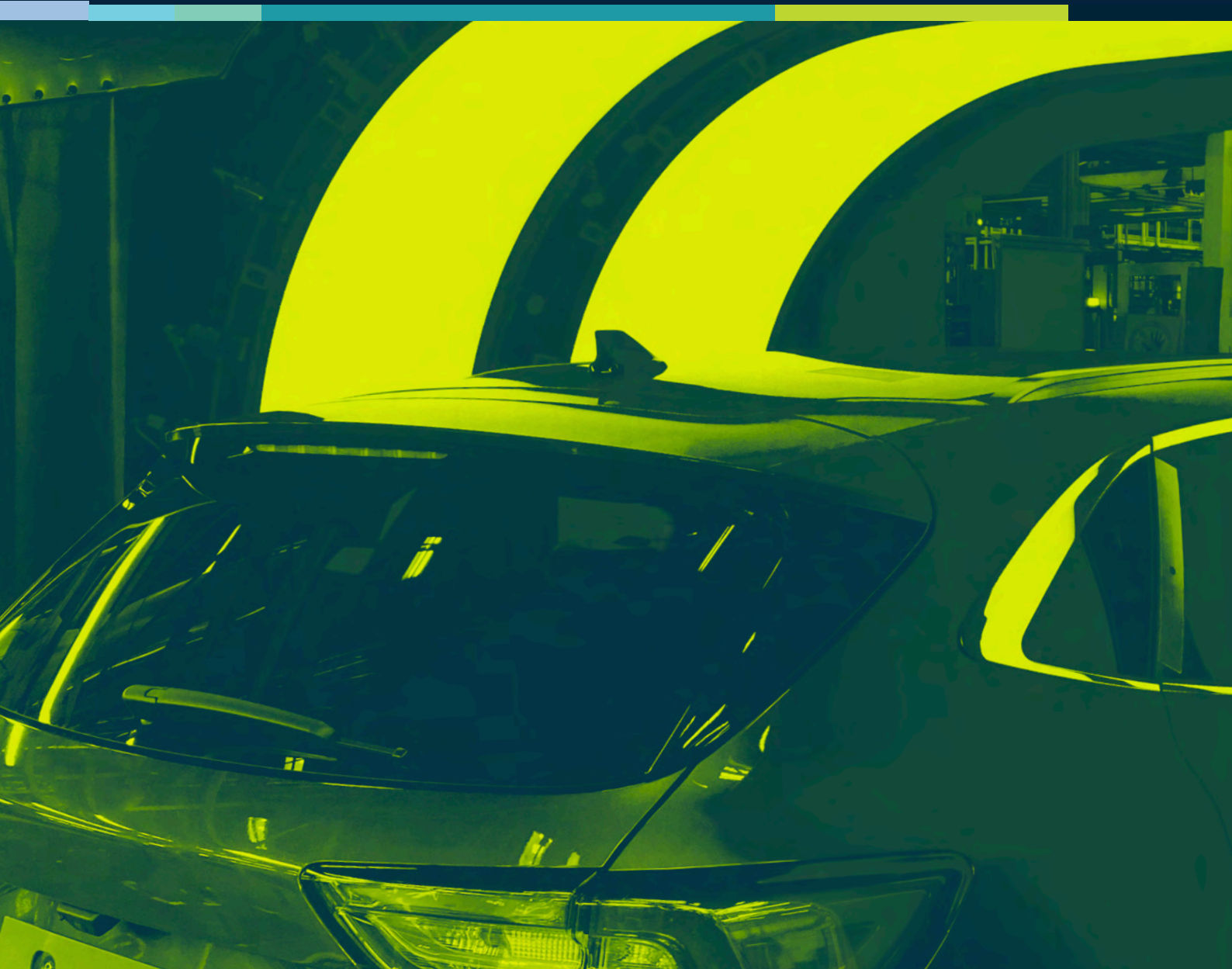




Eines Inline Flush & Gap Inspection System

3D Scanning Inline Metrology System



eines
VISION SYSTEMS



KONICA MINOLTA

Eines Inline Flush & Gap Inspection System

3D Scanning Inline Metrology System



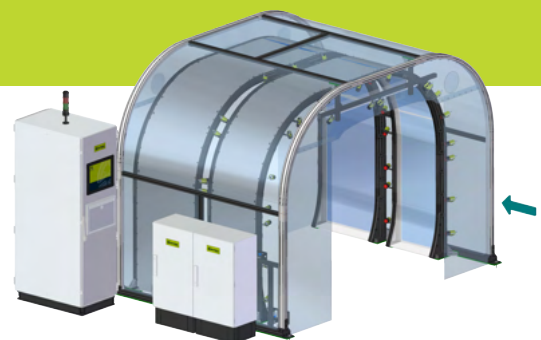
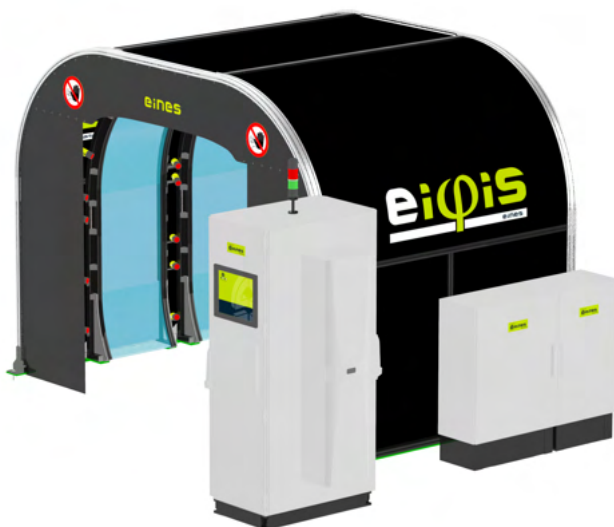
A 3D Scanning Inline Metrology System has been introduced in order to have online accurate data to be used not only as an AID for fit & finish operators on the line but also as a big data retrofit for process improvement at early stages.

Although the main goal of this project is to increase the number of sections measured, the system should be as well accurate, robust, flexible, easy and maintainable to be kept in production without affecting normal production processes as an improvement of current technology in use.

Having the relevant amount of data available at the early stages of a new vehicle model launch is crucial. A "3D scan" of the vehicle could lead to measure an unlimited number of sections.

The integration in the line of a Scanning Vision System for measurement, not only increased incredibly the amount of data being measured but contribute also to following improvements.

/
**A revolution
Flush & Gap
defect detection**
/



The core concept of the system is implementing a real time 3D vehicle scanner by combining state of the art image processing software and high-performance hardware components. The aim of the system is to accurately resolve 3D coordinate point clouds on every vehicle section considered by using specular light and stereo-vision concepts. Point clouds will be individually processed in order to conform 3D mesh structures. Flush and Gap measurement standards will be finally applied to accurately determine values on every section.

- Inline with our family of products based on our EINES Paint Surface System
- Wide LED lights to be installed.
- Higher resolution cameras to be installed.
- While the vehicle gets through the tunnel, programmed shots are performed based on encoder pulses.
- 3D vehicle model allows to locate the sections on the pictures and relate them to Flush & Gap section plane.
- Higher accuracy



Eines Inline Flush & Gap inspection system

/ **100%
verified
units** /

■ Features



Flexible → ability to multiple car models, multiple variants and colors.



Accurate → Higher diameter.



Cost effective → low consumption due to LED lighting and no extra motors or devices.



Two-color → Based on light reflection should affect to system performance.



Small foot-print



Zero maintenance cost → just cleaning glass front cover now and then.



Long life expectancy → Extra long life of LED lighting, without losing intensity.



Easy to use → ability to be used and customized by people with no vision skills.



Expandable → Additional capabilities with vehicle picture.



Traceable → ability to record all data for nice reports and further analysis with incorporated software.



Open → ability to dialog with QLS, CDCII, WBDM, ...

Benefits



No robots →

- Big data
- No Safety issues
- No line stoppages
- Smaller footprint
- Easy to setup/maintain
- No noise emissions
- Moving parts



Inline measurement →

- 100% Production Control
- Line speed independent
- No cycle time concerns
- Unlimited number of sections to be measured; Big data
- Flexibility: Easily define new sections and models
- All types of materials can be measured
- Future enhanced capabilities: Error Proofing, Photo Finish, PCS meas



Cost effective →

- Energy Saving/ Sustainability
- Maintainability
- Reduce Equipment Breakdowns → Line stoppages
- Reduce, re-setters workload and avoid over-touching the production
- Reduce warranty claims

Cameras & Lighting



- Real Non-Touch 3D Measurement



- Shuttered lenses enhances focusing on misaligned parts (conveyor)



- Specular highlight allows to reduce exposure improving blurring & avoiding color influence



/ Future enhanced capabilities /



Product Control

/

**If you can't Measure,
you can't Improve it**

/

Product integrity is only guaranteed by measuring 100% of production. All non-compliant measurements detected are inputted on the traceability system (QLS) which guarantees that all defects will be analyzed and further fixed. This allows Production System to deliver high standard vehicles to our customers.

- **Reduce Internal Alerts**
- **Reduce Customer Claims**
- **Improve Customer Satisfaction**

In addition, several screens have been installed on re-setting stations to clearly indicate operator points to correct. This fulfills two:

- **Facilitate re-setting works on compliant sections**
- **Avoid excessive re-setting on compliant areas**

Process Control

/

**If it is not Error Proofed,
it is not Fixed**

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Continuous process improvement implies measurement and analysis. By increasing the number of parts controlled and providing up-to-the-minute information, system allows to permanently monitor manufacturing process on a wide range of control points.

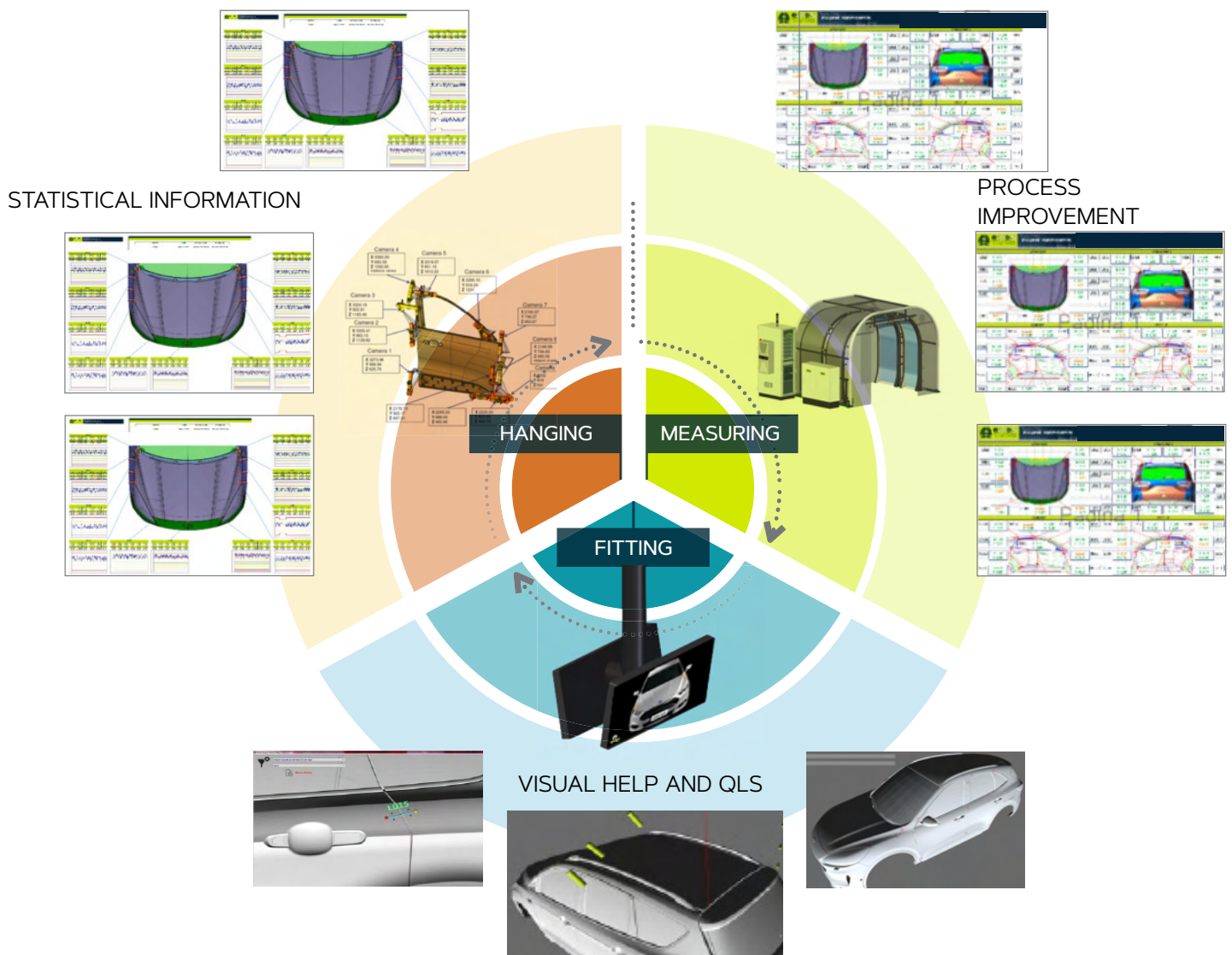
This allows engineering to take data-driven decisions and evaluate its impact as it happens. Good/Accurate decisions on process control will have a significant repercussion:

- **Increase First Time Through**
- **Reduce Re-Setting and Labor hours**
- **Improve Customer Satisfaction**

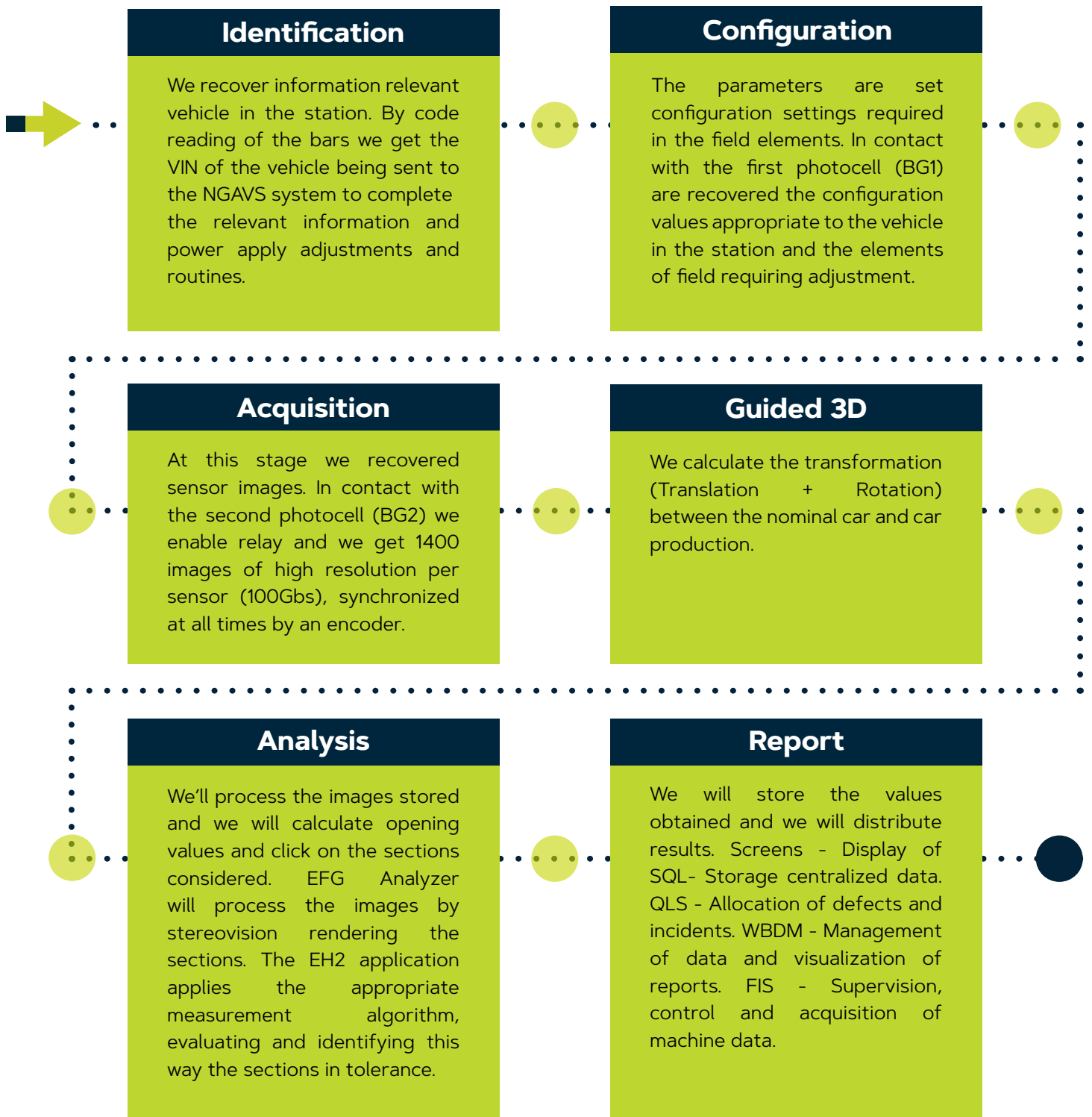
Two main purposes

that each online measurement system must meet

- This technology allows to increase the measured control points on the vehicle body and its parts.
- This information is used not only to validate the production and obviously avoid warranty claims, but also to give feedback in order to quickly react and correct problems at an early production stage. Less workload for the resetters at the Customer Acceptance Line, especially avoiding unnecessary over-resetting or hammering.
- The inline new system is much smaller and occupies less footprint so there is more free space for operations and of course the fact that it is a risk-free installation is beneficial in every way. The fact of not using robots or any other mechanism saves energy and of course avoids any noise emission on the line due to this system.
- So, at first glance we can determine that the new system not only presents great advantages and technical benefits but is also clearly a more profitable investment.
- It is also worth mentioning that the new system consumes approximately half of the energy, which implies some thousands of euros in energy savings per year. And of course, it should be noted that the new equipment is practically maintenance-free compared to the typical maintenance of a robotic cell, which generates significant savings.



Measurement process



/
**Reduces
warranties**
/

Human Machine interface

Results can be shown to operators via monitors, tablets, smart phones, printers and Augmented Reality (AR) allowing finishing corrections done in real time on the line to no interruption of production times resulting in higher productivity and efficiency.



Operator's feedback

Smart watch
Smartphone
Smart tablet
Fixed HMI Station
Augmented Reality



Systems Comparative

	Automatic: Robot	Automatic: Tunnel	Manual
Cost	High	Medium	Low* (Operators)
Cycle time/ measurements	Limits robot movements/20 measurements	Line speed up to 15 meters/minute High Number of measurement (3D modelling)	Line speed or flexible (Operators)
Accuracy	High	High	High (requires training/discipline)
Safety Risks	<ul style="list-style-type: none"> • High/Mitigated with Safety Components • Can anyone get in the cell in front of the vehicle 	None	Low
Flexibility	Medium	Medium	High
Line Stoppages	Yes	No	Process depending
Skills for operating	Robotics/PLC	No	Measuring Sections
Layout	High adaptation	Low adaptation	No adaptation/ KBK

The Company

Eines Vision Systems has become one of the main partners of automotive manufacturers worldwide, developing complex systems and software solutions for measurement, error detection and machine vision systems.

Our name stands for innovative, top-class light measurement technology and unrivalled specialist knowledge over an extremely broad range of applications. Our company is fully focused on providing solutions to the automotive industry, developing machine vision solutions since 1992.

Eines Systems, as a leading technology company, has competitive advantages in the core business of providing automated quality inspection systems and solutions for the automotive production process. The company excels in agile, customer-oriented development for its global customer base.

Our focus on the automotive industry reflects many installations that enjoy benchmark status for these applications worldwide.

As a Konica Minolta Group company, EINES® customers will benefit from the global sales and service capabilities of a global player.

Our business is exclusively focused on the automotive industry and we are a reference in 2D/3D guidance, inspection and quality control systems thanks to our successful installations.

We are proud to have won 3 Henry Ford awards for our innovations. We also hold several international patents on some of our products.

Capable of guarantee world class quality control on the 100% of the cars produced, we are specialized in inline machine vision technology development for the automotive sector.

Our superb fit and finish and our tailor-made vision sensors provide outstanding performance in your ability.

We have as well several international patents on some of our products:

- **Quality Inspection Systems**
- **Metrology Systems**
- **3D Robot Guidance Systems**
- **Part ID & Multi Error Proofing Systems**

/
**All over the
world**
/

Our systems are installed all over the world, from Australia, Asia, the Middle East and Europe to the Americas.

We're proud of verify the correct quality on more than 8.000.000 cars per year for the mayor car manufacturers and provide them:



**WORLD CLASS
QUALITY**



**REDUCE
ERRORS**



**BRAND IMAGE
ENHANCEMENT**



**INCREASE CUSTOMER
SATISFACTION**

Many Konica Minolta Sensing products are used as standard colour measurement instruments. In particular, Konica Minolta has a significant market share in the global for display image quality measurement and inspection and has a strong presence as a market leader.

Konica Minolta has actively promoted investments to strengthen its competitiveness. In 2012, the company acquired Instrument Systems (Germany), which develops high-end optical measurement instruments and has a strong track record in high-performance measurement of LED displays and lighting devices.

In 2015, the company acquired Radiant Vision Systems, USA, which excels in high-resolution 2D display measurement instruments, image processing software and automated appearance inspection systems.

Eines as a part of Konica Minolta Sensing

Finally, with the addition of Eines Systems in June 2019, the Konica Minolta Group will accelerate the launch of visual inspection businesses for the automotive industry.

Konica Minolta remains committed to developing its measurement instrument business as a market leader, offering diverse products and high value-added solutions that enable high-precision light and colour measurement for the ever-growing ICT and automotive industries.





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