Flexible, Efficient, Cost-effective
Solutions For Tomorrow’s Car Production Strategy

Machine Vision for Automotive Production

ISRA VISION
Quality assurance and high-precision position detection systems for component handling applications are essential items in the automation engineering toolkit. Intelligent vision systems provide the key to higher productivity, greater efficiency and total quality assurance. They ensure that the required precision and speed are achieved during robotic assembly and production, and they offer significant potential for enhancing the efficiency of automotive manufacturing. Vision systems must deliver 100% availability and reliability. They also have to be user friendly and suitable for industrial environments. It takes a great deal of basic know-how and applications expertise to develop these machine vision systems, which is what the market leader ISRA can offer you. The user-friendly ISRA systems are designed for the most demanding applications, and they are carefully tailored to the specific application. They offer a variety of solutions including 2D systems, innovative 2 1/2 D technology and multiple 3D stereo systems at an unbeatable price/performance ratio, and they reflect an attention to detail that is based on 20 years of experience.

The entire solution is supplied from a single source. More than 6,000 ISRA systems are currently used by leading car manufacturers, providing the most efficient possible solution in highly complex applications 24 hours a day, 7 days a week.

Robots with perfect vision in the third dimension

- Identification of parts and components
- Position detection in 2D/3D
- 2D/3D real-time robot guidance
- 3D vision with a single camera
- Learning robot guidance

Zero-Defects in production

- Visual inspection
- Completeness check
- Adhesive application check
- Matrix code reading
- Lettering verification
- Dimensional check
- Type check

Make maximum availability and service part of your everyday routine.
Car manufacturers, automotive suppliers and integrators are always looking for ways to improve productivity and quality, and they have been working with ISRA for many years. ISRA VISION is a professional, highly qualified partner and supplier of system solutions. Because the company is very familiar with all of the steps in the car production process, it is well able to assess where, when and how machine vision can best be used to optimize the process. You work together with a highly qualified team which joins forces with your engineering team to design and deploy solutions today which are ready to handle tomorrow’s challenges.

When you work with ISRA, you engage in long-term collaboration with a partner which is able and willing to meet your challenges. As a global car manufacturer, you can be sure that you will get everything you need from ISRA including expert advice, service, confidentiality and total problem resolution. We are focused on cost-effective solutions for the automotive manufacturing industry, and we can help you become more competitive and cost-effective. We can deliver and support solutions worldwide which give our customers exactly what they need and want.

Challenge us.

**ISRA VISION - the right partner for the automotive industry**

DaimlerChrysler  
VW  
Opel  
GM  
Volvo  
Honda  
Hyundai  
Saab  
Renault  
Fiat  

Audi  
BMW  
Ford  
Seat  
Skoda  
Porsche  
Rover  
Nedcar  
Vauxhall  
Scania

**100% inspection for a flawless finish**

- automated  
100% inspection of painted car bodies  
- inspection of dents

**SURFACE VISION**

Work with us to improve your **productivity** and **efficiency**.
The right solution for every step in the process:  
**ISRA VISION** provides the "eyes" for **innovative automotive production**

### Press loading and unloading

Machine vision systems make an indispensable contribution throughout production. This starts early in the process, for example during stacking and unstacking of body parts exiting a press, which are then moved to a rack.

### Part removal

A number of specialized robots are used in body assembly for welding, sealing and adhesive application operations. 2D and 3D machine vision systems provide precise work coordinates which enable the robots to remove the parts from the racks, wire mesh containers, or pallets. Flexible, miniaturized cameras are mounted on the robot hand.

### Door assembly, roof assembly

**Assembly of mounted parts**

Multiple 3D sensors deliver very high precision data during best-fit installation of doors, roofs and mounted parts. Part measurement and checking of gap alignment and flush mounting following installation are now standard.
Gap alignment and flush mounting

When items such as the roof, hood, fenders and doors are installed during car body assembly, flush mounting, perfect fit of the parts and adherence to dimensional specifications are major quality criteria. This is another example where machine vision is the right tool for the job. Innovative technology provides fast and efficient verification of conformance to specification.

Window flange masking with in-process seam inspection

Machine vision systems determine the exact position in three dimensions of car body components which need to be joined in this process step. This enables the robots to apply the adhesive at exactly the right place. The quality of the glue coating (width, position and absence of voids) can be checked at the same time.

Body cavity protection

During painting operations, paint robots need very accurate part position information, so that they can quickly open the doors, hood, trunk lid, etc. Multi-camera systems detect all six spatial degrees of freedom of the body and body parts with millimeter accuracy, so that protection can be applied.

Paint finish inspection

Paint finish defect recognition systems are used during the sequence of painting operations. In contrast to the human eye, these systems are absolutely reliable and objective, and they do not suffer from fatigue. They immediately detect irregularities which can be automatically marked and eliminated at this stage.

Application of adhesives

Adhesive bead is used for sealing, joining or support during a number of car body assembly operations. Major assessment criteria for the application of adhesive include absence of gaps, correct positioning and adherence to a specified width and height. State-of-the-art machine vision technology is used for in-process or post-process inspection.
Powertrain

During complex transmission and motor assembly operations, intelligent recognition strategies are used to remove individual components of any size, rotation and position from the delivery conveyors or pallets, feed the parts into the production process and mount them. Optical systems running in parallel perform quality control on items ranging from individual parts to complete assemblies.

Cockpit assembly and inspection

High-performance machine vision systems can handle a wide variety of tasks. Techniques such as simple teach-in can be used to expand the functionality to handle future vehicle generations. Positive, fully-automatic identification of a large number of details in the cockpit facilitates problem-free assembly and quality control.

Installation of door seals

Cameras and lighting are mounted onto robot arms to create flexible, cost-effective robot vision solutions wherever assembly and inspection work needs to be done in the vehicle interior or in places where access is difficult.

Roof panel, roof lining and roof seal

Robots using state-of-the-art 3D multi-cameras and precise position information provide fully automatic installation and perfect fit of the roof panel, roof lining and installation of panels and seals.
Window assembly and inspection of the adhesive bead

Cost-effective insertion and precise placement of car windows is a complex operation. This is one of the strengths of ISRA VISION. This operation is combined with verification of the adhesive bead which is applied automatically. The bead is checked for voids and for variations in width or height. This can now be done using innovative machine vision which operates at process speeds.

Wheel assembly

A robot vision system is responsible for reliable, safe wheel mounting operations. Vehicle-specific features are taken into account during verification of the correct wheel type. Assembly can take place in stop-and-go mode or while the chassis is in motion.

Multiple final inspection

The goal of automotive manufacturing is to produce zero-defect cars that are correctly assembled. After the cars have passed through all of the process inspection stations, a final check is made at the end of the line. Integrated machine vision identifies items such as wheels, rims and type labels, checks that they are complete and properly installed and performs a plausibility check based on the model information.

Fueling

Fuel has to be put into the vehicle for initial functional tests and to move the vehicle off of the production line. Robots use machine vision to repeatedly perform this operation in 3D space exactly as defined, without fatigue and with excellent reproducibility.
Innovations for automotive industry

Get the most our of your production operations with ISRA, the technology leader

Innovations for automotive industry

ISRA VISION has been a leading supplier of high-performance quality inspection, robot guidance and production logistics systems for more than 20 years.

Our systems are used in the automotive industry throughout the world. Our goal is to offer a complete portfolio of standard solutions which meet the full spectrum of requirements along the entire process chain.

Thousands of successful installations worldwide demonstrate ISRA’s experience and technological expertise in machine vision.

World class automation

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A summary of the advantages

Customers choose ISRA over the competition for the following reasons:

- Our development activities are fully focused on the needs of our customers.
- We consistently invest in our own know-how in all of the core areas of machine vision.
- At our company, the customer relationship does not end when a new system leaves our shipping dock. The Customer Support Center operates a range of services including a telephone hotline, teleservice, on-site service and maintenance to support our customers during operation of their systems and equipment and to help them increase their productivity.
- More than 300 team members at our locations in Europe, North America and Asia are committed to helping you achieve success.

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