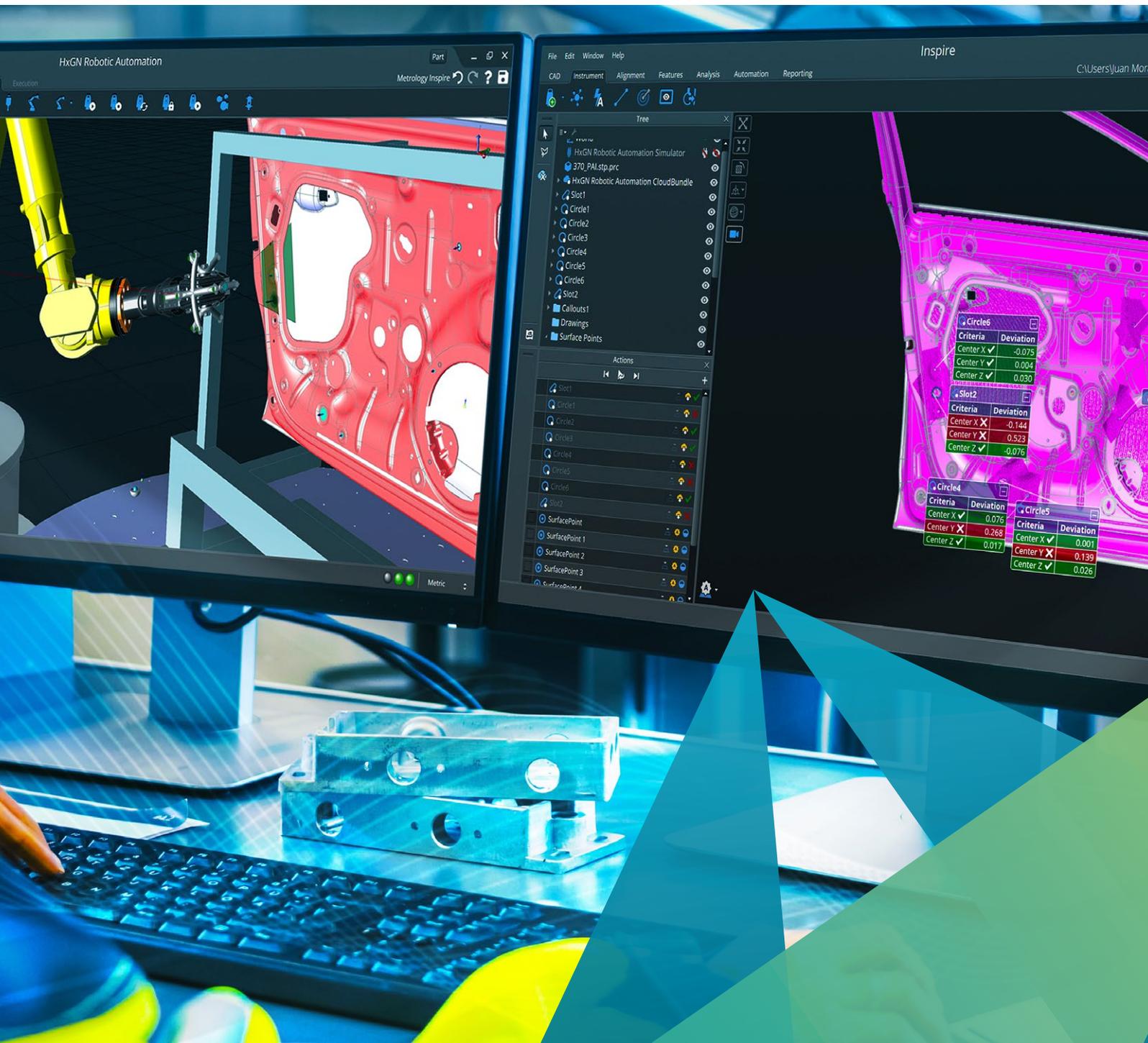
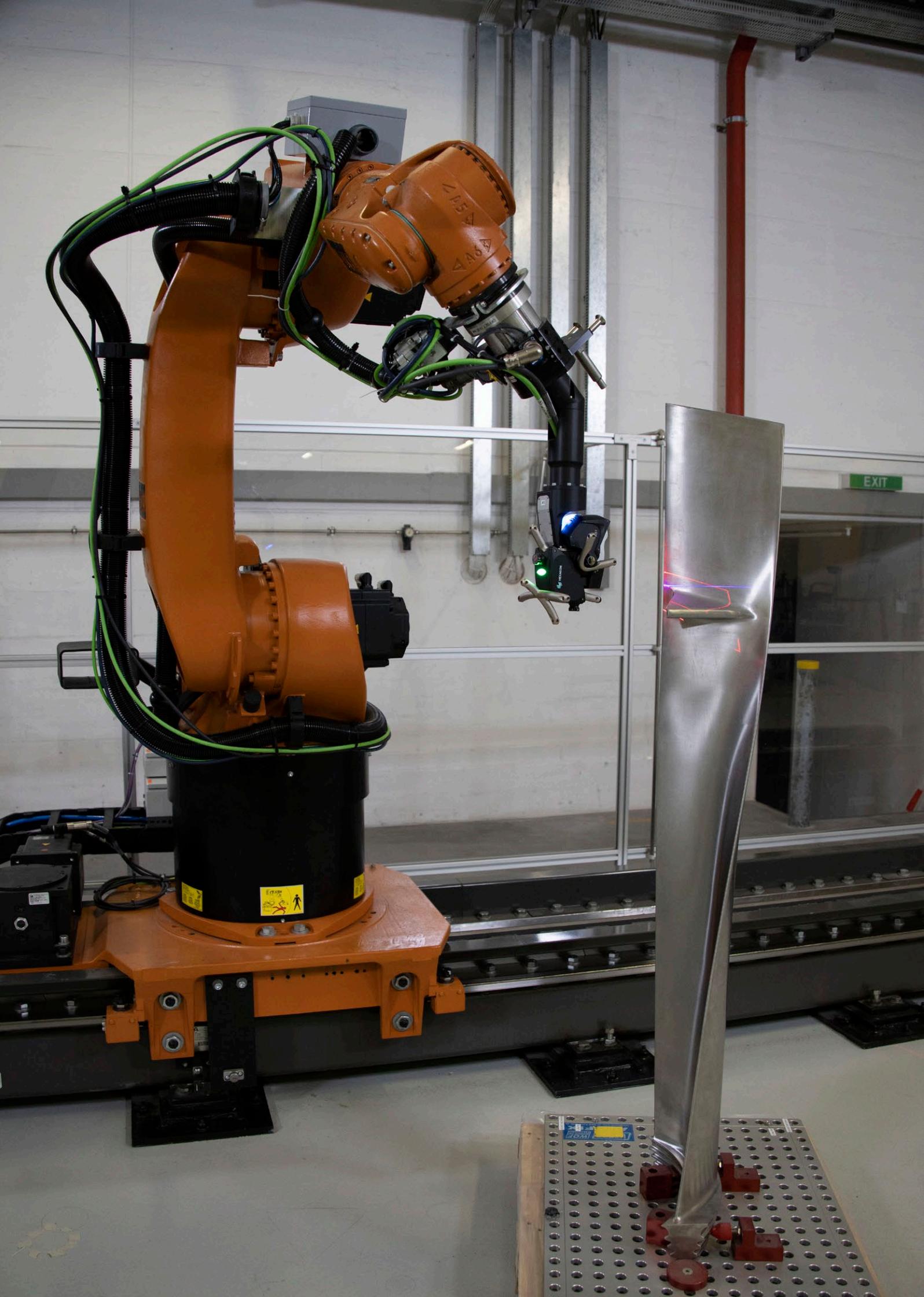


Robotic automation solutions for inspection

Accessible and efficient robot-based inspection

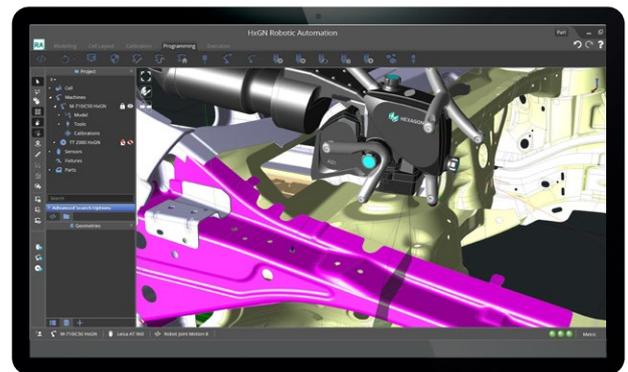
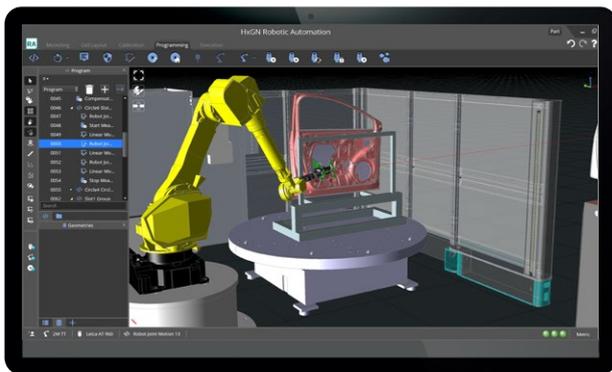




Efficiency, automated

As manufacturing becomes increasingly data driven, the ability to rapidly capture large data sets for quality assurance, process control and product and process optimisation offers a competitive advantage in the age of smart manufacturing. Automated inspection solutions provide this data capture ability but can be complex to deploy and see return on investment.

Hexagon's automated measurement systems are designed to remove the complexity from the design, installation and operation of robot-based inspection cells so that every one delivers value. Its turnkey solutions provide rich data capture at the point of production with the ease and peace of mind of working with a single vendor. For simplicity, speed and convenience there is a standard cell while for more specialised requirements there is extensive flexibility with Hexagon and third-party hardware components. Powered by the intuitive HxGN Robotic Automation software, each cell integrates seamlessly with factory workflows to provide the insight to make manufacturing smarter.



Why automated inspection?

Faster data acquisition and defect detection

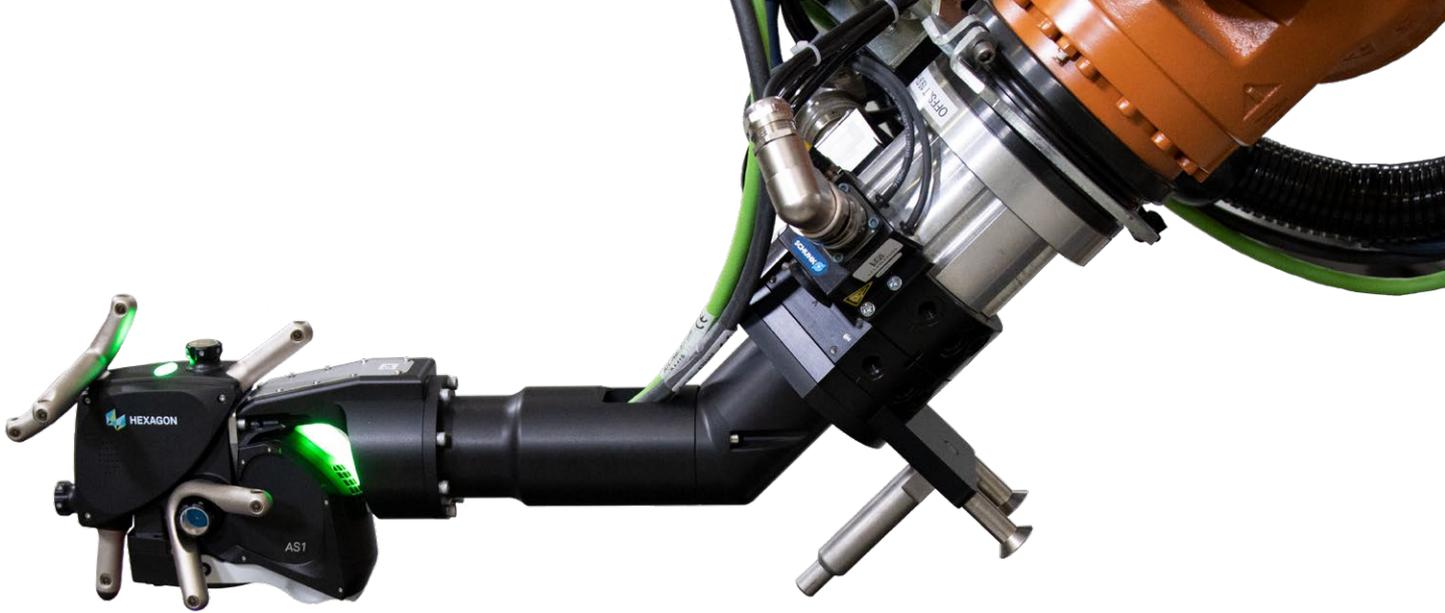
Advanced automation is a key smart manufacturing technology and offers huge potential for productivity gains throughout production and inspection operations. An automated inspection system's speed and flexibility can reduce measurement time by up to 300% compared to traditional inspection methods, meaning that issues are detected and corrected sooner than ever before.

More data, better decision-making

In today's increasingly data-driven manufacturing environment, automated inspection is the fastest, most efficient and most reliable way to capture data on the shop floor during production. Once operational, an automated inspection cell can continuously collect and process comprehensive data sets so that manufacturers can better understand and substantially improve production quality with fast or even automated decisions. Integration with advanced analytics tools and statistical process control software offers deep insight for stakeholders across the business.

Better equipment utilisation

Automated inspection cells can be configured for 100% utilisation of the equipment with no wait-time during loading and unloading, maximising the return on investment in measurement technology. With inspection cycles running up to 24/7, throughput is exceptionally high and avoids the bottlenecks traditionally associated with quality assurance. And, with offline programming tools removing the downtime associated with cell programming and setup, equipment is always available to measure.



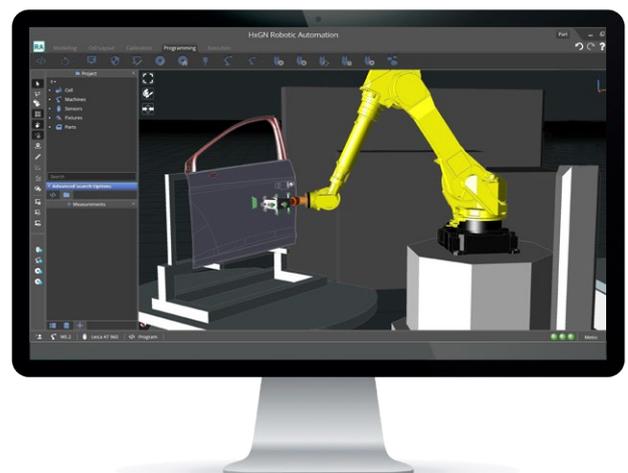
Configurable to meet the demands of almost any application

Automated inspection cells can be configured in several shop-floor locations with different high-speed sensors, specialised software, robots and part handling equipment to support one or many applications. Off-line configurations are typically used for part sampling or supporting inspection from multiple production lines. Near-line configurations are ideal for larger batch measurements where speed is of the essence, while inline configurations enable 100% inspection for trend analysis and rapid issue resolution. Flexible, shop-floor ready systems that can adapt to multiple part sizes and applications ensure fast implementation and maximise the system throughput.



Gather insight for smarter manufacturing

Manufacturers today are looking for smart solutions that improve operations, increasing efficiency and gaining flexibility through automation. As emerging technologies like AI and machine learning change the potential of data leverage, automation and robotics are critical to both providing the quantities of data needed to drive smarter processes, and to utilising it to make processes more efficient and sustainable.



Why Hexagon?

Metrology expertise

With the broadest metrology portfolio on the market and years of experience in sensor and software development, Hexagon has deep knowledge of the complexities of automated metrology and has assembled the right combinations of technology to overcome them.

Dedicated automation software

Orchestrating the sensors, software and robotic equipment of an inspection cell from a single, intuitive interface, HxGN Robotic Automation makes automated measurement more accessible, more efficient and more reliable.



Open interfaces for interoperability

Hexagon solutions are designed to integrate with the wider manufacturing environment, including third-party sensors, software and robotic equipment, lowering the cost of entry and retaining the value of existing installation.

Adaptability and scalability

With the every-changing requirements of modern manufacturing, Hexagon recognises that automated inspection solutions will need to grow with the business and therefore makes it easy to integrate new technologies after installation to support new applications.

Single-vendor solution

Whether a standard cell or a custom solution, Hexagon can provide a complete plug-and-play integrated solution for your metrology automation requirements, from automated part inspection to quality data management and process control and optimisation.



HxGN Robotic Automation

Software designed for integration

Every Hexagon automated measurement cell is powered by the dedicated HxGN Robotic Automation software, created specifically to make automated metrology more accessible and efficient.

HxGN Robotic Automation is an intuitive, flexible and scalable robotic control software designed to simplify programming for automated measurement and inspection applications. It provides the toolset to efficiently plan, program and control robotic cells based all major robot suppliers, as well as integrating with the wider manufacturing software ecosystem, simplifying the data acquisition process for smarter manufacturing processes.

To maximise equipment utilisation, HxGN Robotic Automation's offline programming environment offers accurate path simulation that allows virtual commissioning of the system and rapid deployment of programs to the real cell. Whether the system is off-line, near-line or inline, HxGN Robotic Automation ensures rich data capture without the complexity.

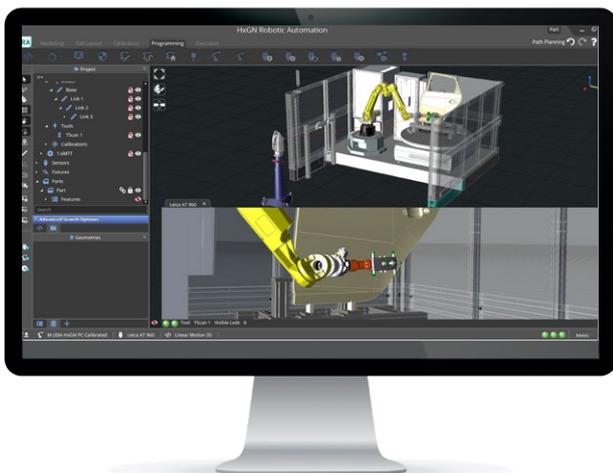
HxGN Robotic Automation at-a-glance:

- **Machine modelling** enabling users to either build from scratch or edit any kinematic or static device that will be part of the robotic solution
- **Cell modelling and layout tools** to design and validate the solution for the required application
- **Automatic robot path generation** making programming easier than ever
- **Real-time collision detection and avoidance tools** to ensure safe robot path generation
- **Offline and online robot program execution** for offline programming and validation before the software takes full control of the real cell for fast online implementation
- **Integration with Hexagon metrology software** such as PC-DMIS and Inspire extends the analysis capabilities for measured data
- **Advanced analytics and process control** integration to make best use of the large quantities of data captured
- **Easy integration of new hardware and software** for more flexible, scalable inspection cells



Intuitive

Simple UX principles, intuitive workflows and automated program generation enable inexperienced operators to program automated inspection safely and efficiently.



Flexible

The hardware- and software-agnostic toolset integrates seamlessly with existing workflows and technologies, and enables new sensors, software and robotic equipment to be easily added to support new applications.



Scalable

A modular approach in the software enables manufacturers to scale to different part sizes, cell configurations and applications, from offline quality control to inline quality assurance and continuous data capture for smart manufacturing.

Customer success: ŠKODA AUTO

When ŠKODA AUTO decided to reconfigure the measurement processes in its Czech Republic factories towards 3D optical measurement, the company turned to long-time metrology partner Hexagon to co-create an automated measurement solution.

The laser-tracker based cell uses 3D laser scanning as the primary data-capture method, enabling rapid digitalisation of freeform surfaces like car body parts. Measurement routines are created in PC-DMIS metrology software, ŠKODA AUTO's standard software for all factories in the Czech Republic. Rotary tables and a flexible fixturing system ensure maximum utilisation of the measurement equipment, so ŠKODA AUTO could increase throughput while also capturing more detailed measurements.



The HxGN Robotic Automation software significantly reduces the time required for the offline programming of robotic measurement and the debugging of measurement programs”

Martin Jehlička,
Measuring Centre manager, ŠKODA AUTO



The system was designed to deliver the versatility ŠKODA AUTO needed, with an installed tool changer unit allowing for direct automated switching between high-speed scanning and more accurate tactile measurement. This variability means the system will always be able to perform measurement of difficult-to-access areas, such as openings, in a way that would simply not be possible for a less bespoke solution.

A key benefit of the new cell for ŠKODA AUTO is the ability to run offline programming, both for the part program in PC-DMIS and for the robotic installation itself with the dedicated HxGN Robotic Automation software. This allows the quality teams to start measuring very quickly when new parts go into production, with no downtime required for the cell.

With the offline measurement solution already showing great value for ŠKODA AUTO, the team are keen to move forward with new Hexagon automated installations for in-line and at-line measurement.



“...it is already clear that this is just the beginning. We would like to continue other projects as soon as possible, and use the HxGN Robotic Automation software for in-line and at-line measurement”

Martin Jehlička,
Measuring Centre manager, ŠKODA AUTO

ŠKODA AUTO's solution

- Two fully automated measurement cells for offline sheet metal inspection
- Leica Absolute Tracker AT960 laser tracker with 3D laser scanner and tactile sensors providing a flexible yet accurate measurement toolset
- Dual rotary tables with FIVE U-nique fixturing system enabling maximum sensor utilisation
- Robot Offline Programming, Online Program Execution and Cell Control with HxGN Robotic Automation software
- Inspection and analysis with PC-DMIS metrology software



Hexagon is a global leader in sensor, software and autonomous solutions. We are putting data to work to boost efficiency, productivity, and quality across industrial, manufacturing, infrastructure, safety, and mobility applications.

Our technologies are shaping urban and production ecosystems to become increasingly connected and autonomous – ensuring a scalable, sustainable future.

Hexagon's Manufacturing Intelligence division provides solutions that utilise data from design and engineering, production and metrology to make manufacturing smarter. For more information, visit hexagonmi.com.

Learn more about Hexagon (Nasdaq Stockholm: HEXA B) at hexagon.com and follow us [@HexagonAB](https://twitter.com/HexagonAB).