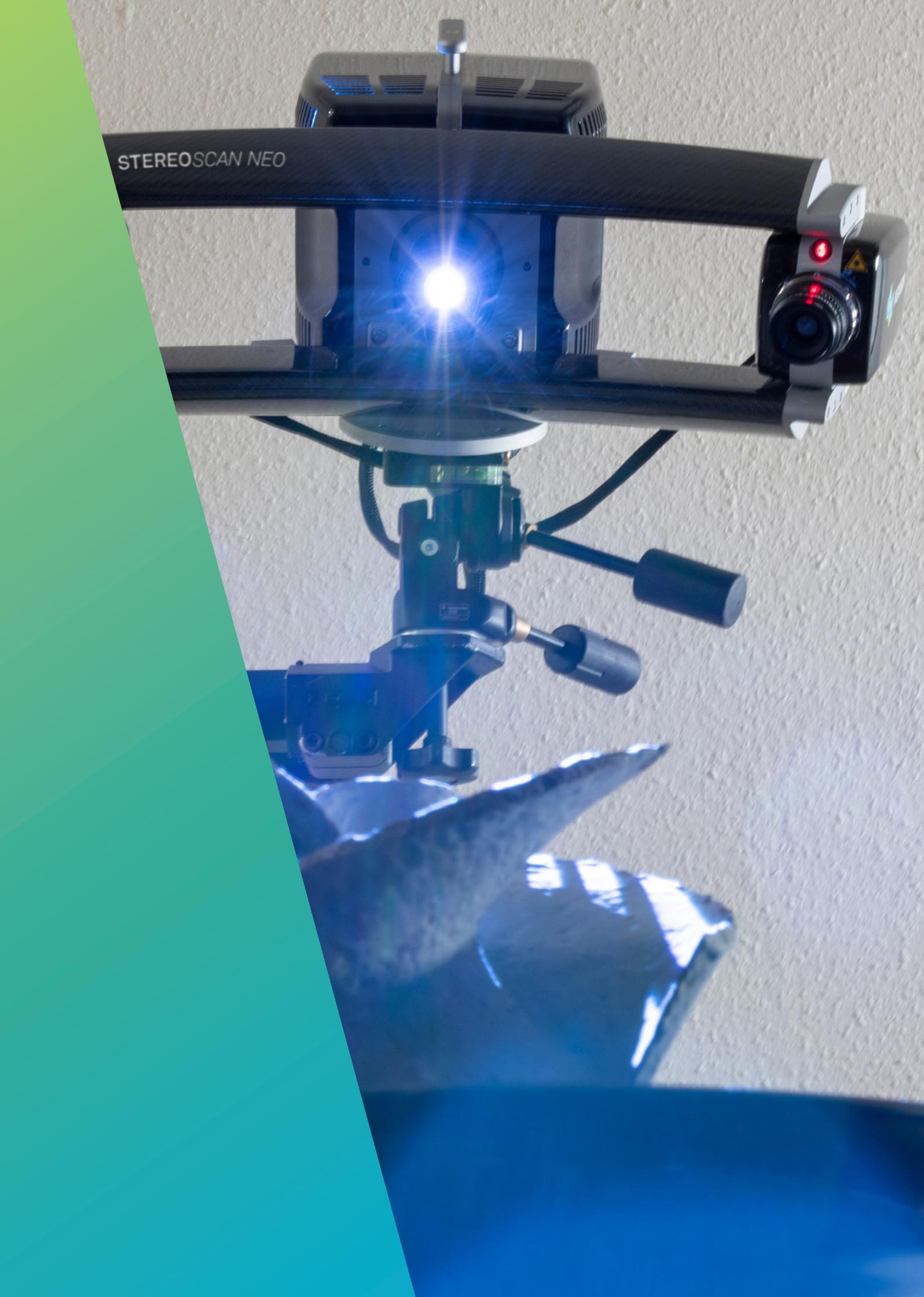


Structured light scanning solutions

High-accuracy optical 3D scanning technology



STEREOSCAN NEO



Advanced structured light scanning

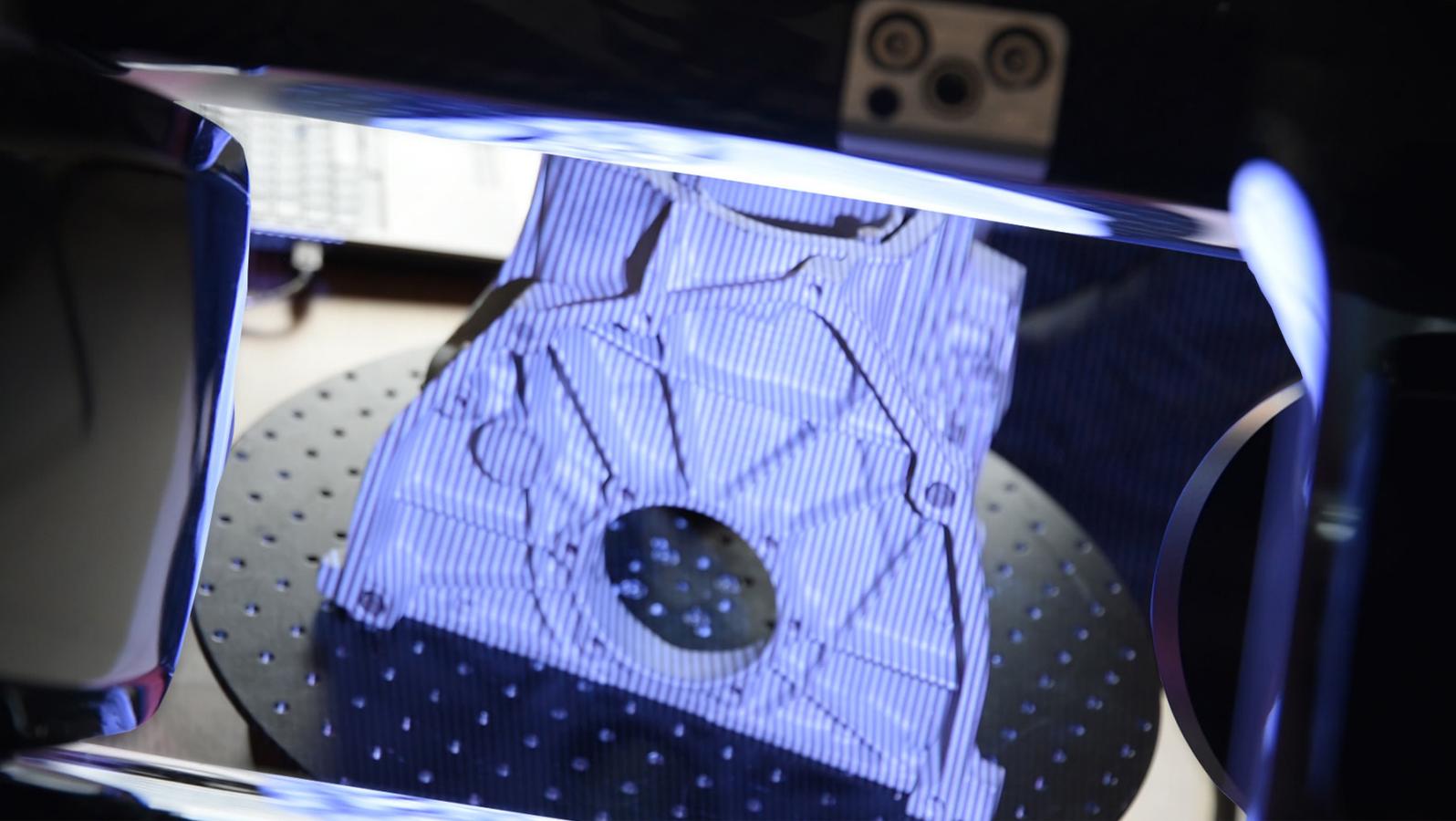
Structured light scanning is a well-established and highly reliable technology for three-dimensional surface acquisition. Even complex surface geometries are captured swiftly and at a high level of resolution and accuracy with this advanced non-contact optical 3D scanning technique.

Owing to their exceptional mechanical and thermal stability, Hexagon's range of structured light scanner systems can be employed across a multifaceted array of applications. Extremely sturdy by design, these two-camera systems are renowned for their extraordinary combination of ruggedness and precision, allowing them to meet the challenges of modern metrology from the most sterile quality room to the dustiest shop floor.

Hexagon structured light scanning technology works with the dedicated OptoCat software platform, designed to quickly transform high-quality measurement information into precise digital mesh data, as well as directly within third-party metrology software through plug-ins based on the SLS SDK.

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Introduction to structured light

High-speed, high-resolution, high-accuracy measurement

Structured light scanning, sometimes referred to as white or blue light scanning, is a method of measuring surfaces in three dimensions that involves projecting light patterns onto the measurement surface. High-resolution cameras are then used to capture this projection at predefined viewing angles, and the resulting images are then analysed and used to derive highly accurate dimensional information about the measurement surface.

This means that a structured light scanning system measures the entire visible surface of the measurement object at once, resulting in an exceptionally high measuring point density. This not only delivers extremely precise real measurement data, but also a very high level of resolution. The process is also very fast, with an individual measurement sequence completed within one-to-several seconds.

The entire measuring process takes between a few seconds and several minutes and is completed as soon as images from all sides of the object have been captured. Individual scans of different sides of the measurement object are then aligned by geometry or with the aid of targets placed around the object before measurement. Subsequently, all individual scans are merged to a single triangle mesh.

Structured light scanning technology

Key facts

- Structured light scanners collect high-density surface data at extremely fine accuracy levels, making them ideal for complete object digitisation as well as for high-accuracy feature inspection.
- Hexagon's range of structured light scanners uses a fringe projection light pattern, in which a projector emits a sequence of fringe patterns onto the surface that is to be measured.
- Advancements in fringe projection technology mean that scanning of glossy and dark surfaces can typically be achieved with no need for pre-treatments such as spraying.
- High-quality hardware and adapted measuring strategies allow Hexagon structured light scanning systems to measure reliably in even challenging industrial environments.
- The 3D triangle mesh output of the scanner is instantly available as a dataset in various formats, compatible with any type of further processing program.

Key applications

Structured light scanning in an industrial manufacturing context has several key uses that fall within two broad categories.

Quality control

The 3D datasets created by a structured light scanning system are perfect for quality control processes in manufacturing. From dimensional feature inspection to geometric dimensioning and tolerancing, the high-speed, high-resolution data provided by a structured light scanner is ideal for inspecting and validating feature-rich small-to-medium sized components, and even large parts with photogrammetry add-ons installed.

Reverse engineering

The ability to measure an existing part to determine its characteristics and then create an accurate CAD model can be extremely useful in a variety of manufacturing contexts. This is particularly the case where there is a significant manual aspect to the product design process, such as is often seen in automotive design. Alternatively, it can be important during restoration work to be able to accurately produce digital maps of parts for which original design documentation no longer exists or was never created, such as arts and cultural heritage artefacts.



Key advantages

- Short scanning times through fast digital projection.
- Smart Phase Projection for scanning of glossy and dark surfaces without pre-treatment.
- Smart Data Capture technology allows for fast acquisition and variable resolution.
- Colour back-projection of measurement results.
- Quick and easy exchange of measurement fields.
- Maximum degree of feature accuracy through high-resolution camera sensors.
- High-stability scanning.
- Ready for automated robotic inspection thanks to rigid design and double carbon frame.
- Accessories such as turntable and turn-tilt units allow for semi-automated scanning.
- Handheld probe option.
- Combinable with photogrammetry systems.



StereoScan neo

The benchmark in structured light scanning

As Hexagon's flagship structured light scanner, the StereoScan neo combines superior resolution and accuracy with an arsenal of innovative features that fundamentally improve the scanning experience.

The StereoScan neo is an incredibly versatile optical 3D scanning system. Innovative Smart Data Capture technology allows the system to acquire data at extremely high speed without compromising data quality while also allowing for variable resolution as required by the application at hand.

Equipped with an advanced digital projector that utilises ground-breaking projection patterning and full-colour back projection, the StereoScan neo is one of the most advanced structured light scanners ever produced. With data acquisition powered by either 8- or 16-megapixel twin digital cameras, and measurement fields ranging from 75 to 1100 millimetres that can be quickly and easily changed by the user as necessary, the StereoScan neo is simply the most versatile and powerful structured light scanner on the market.

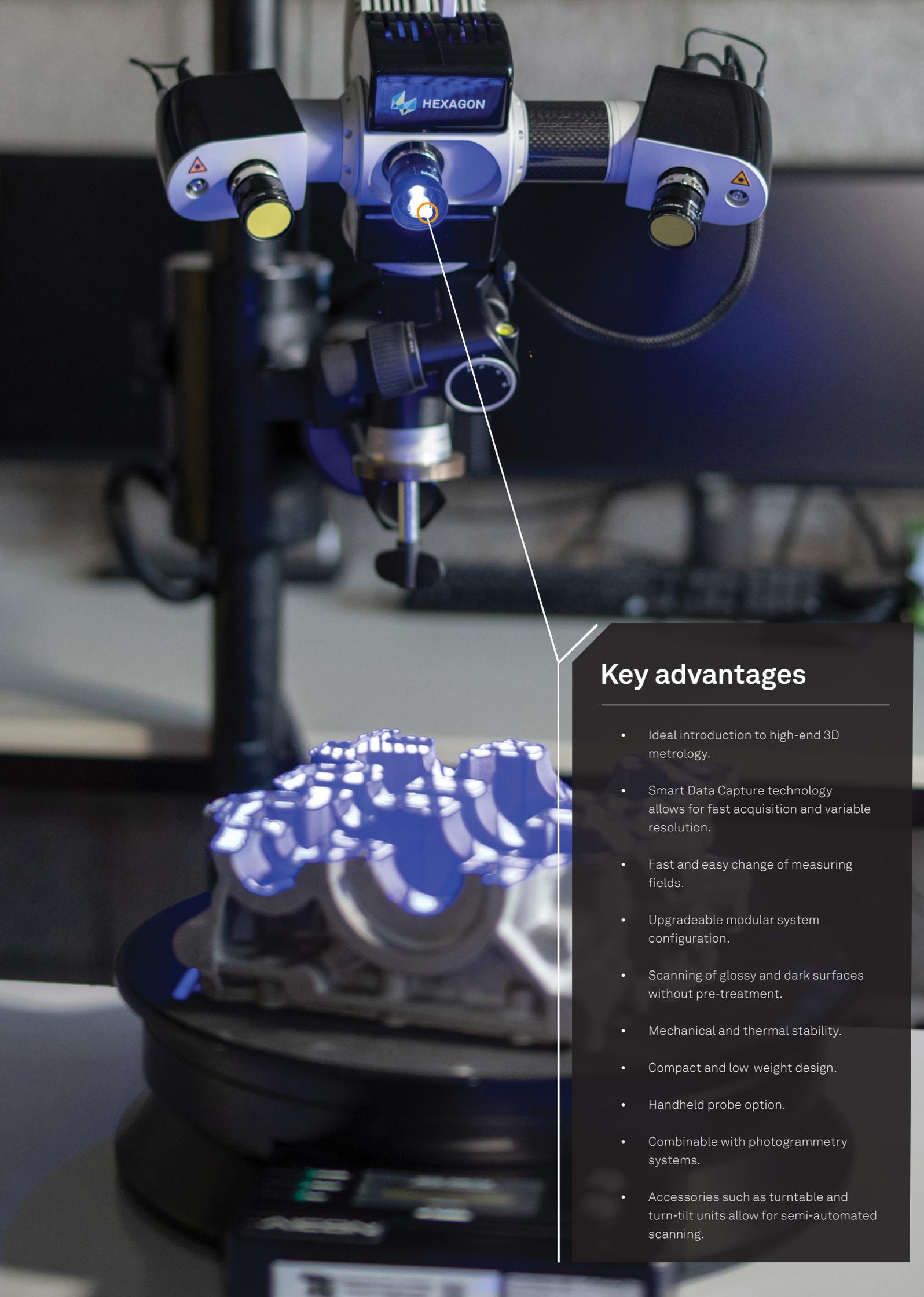
Smart Phase Projection

Hexagon's Smart Phase Projection technology employs a cutting-edge type of fringe projection pattern designed to yield the highest quality data even when facing the most challenging measurement surfaces. This technology represents a pioneering departure from classical fringe projection techniques that means the StereoScan neo truly excels when faced with glossy and dark surfaces with no need for pre-treatment.

Variable Light Projection

The StereoScan neo's innovative Variable Light Projection (VLP) technology is an adaptive full-colour projection technique that allows the scanner to go further than just projecting the patterns necessary for the scanning process. With VLP, the generated measurement results can be instantly projected back onto the measurement surface, allowing for the easy colour-coded visualisation of deviations from CAD right on the part being measured.





Key advantages

- Ideal introduction to high-end 3D metrology.
- Smart Data Capture technology allows for fast acquisition and variable resolution.
- Fast and easy change of measuring fields.
- Upgradeable modular system configuration.
- Scanning of glossy and dark surfaces without pre-treatment.
- Mechanical and thermal stability.
- Compact and low-weight design.
- Handheld probe option.
- Combinable with photogrammetry systems.
- Accessories such as turntable and turn-tilt units allow for semi-automated scanning.

SmartScan

Powerful and compact 3D scanning

Discover high-speed data acquisition at extremely high levels of detail with the non-contact 3D optical scanning technology of the SmartScan. Objects are digitised within seconds, irrespective of their size and complexity, and are directly available as high-precision 3D data in numerous standard formats for further processing.

With a compact design and low weight it's a fully mobile system, ready to go to work in the most challenging workshop conditions. Thanks to a high-tech carbon-fibre structural design, the SmartScan maintains extremely stable and reliable performance even under the pressure of temperature fluctuations.

Available in a variety of system configurations, and fully upgradeable thanks to its modular architecture, the SmartScan is the ideal choice for effective and affordable measurement performance across a range of applications and industries. Choose between the standard twin 5-megapixel camera version and the high-end twin 12-megapixel camera arrangement.

Smart Data Capture

The Smart Data Capture technology developed for all Hexagon structured light scanners powers data acquisition at extremely high speeds while maintaining high data quality. It also allows for the varying of measurement resolution as required by the demands of the specific application.

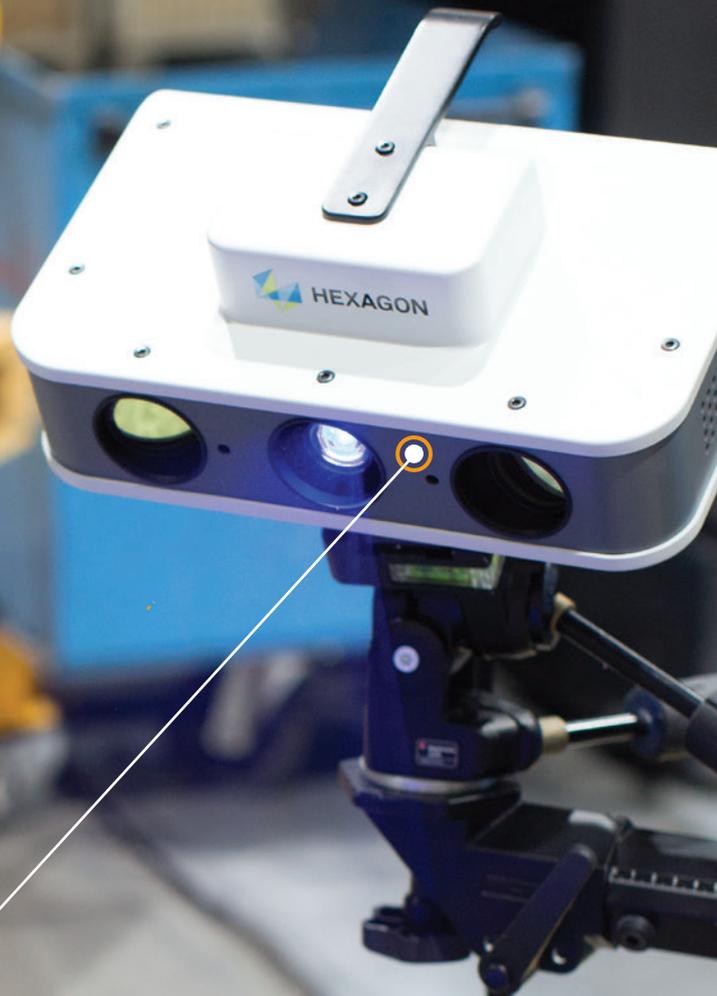
DPA photogrammetry

By working in combination with a high-end photogrammetry system, the SmartScan can be used to digitise considerably larger parts down to the smallest details with high accuracy maintained throughout a larger measuring volume.



Key advantages

- Ideal introduction to 3D metrology.
- Smart Data Capture technology allows for fast acquisition and variable resolution.
- Compact and low-weight design.
- Short working distance ideal for applications in narrow environments.
- Various fixed configurations for diverse range of measuring tasks.
- High-resolution sensor technology for maximum detail.
- Scanning of glossy and dark surfaces without pre-treatment.
- Handheld probe option.
- Combinable with photogrammetry systems.
- Accessories such as turntable and turn-tilt units allow for semi-automated scanning.



PrimeScan

Scanning made simple

An attractive entry-level solution for the precise 3D digitisation of industrial components, the PrimeScan stands on a foundation of innovative fringe projection technology that allows it to deliver high luminous power and excellent projection quality.

Thanks to a compactly designed unit with a base area the size of an A4 sheet of paper and a total system weight of less than four kilograms, the PrimeScan is ready to go anywhere that high-resolution measurement is needed. Combined with a short working distance, its small form factor makes the PrimeScan perfect for scanning in special application areas, such as on a desktop or in difficult to access parts of the shop floor.

The scanning of glossy and dark surfaces without pre-treatment is aided by the PrimeScan's powerful projector, while the initial positioning of the measurement object is simplified by the scanner's integrated laser pointers. Selected robots and accessories enable both automated measurement and easy data acquisition within both smaller and larger volumes.

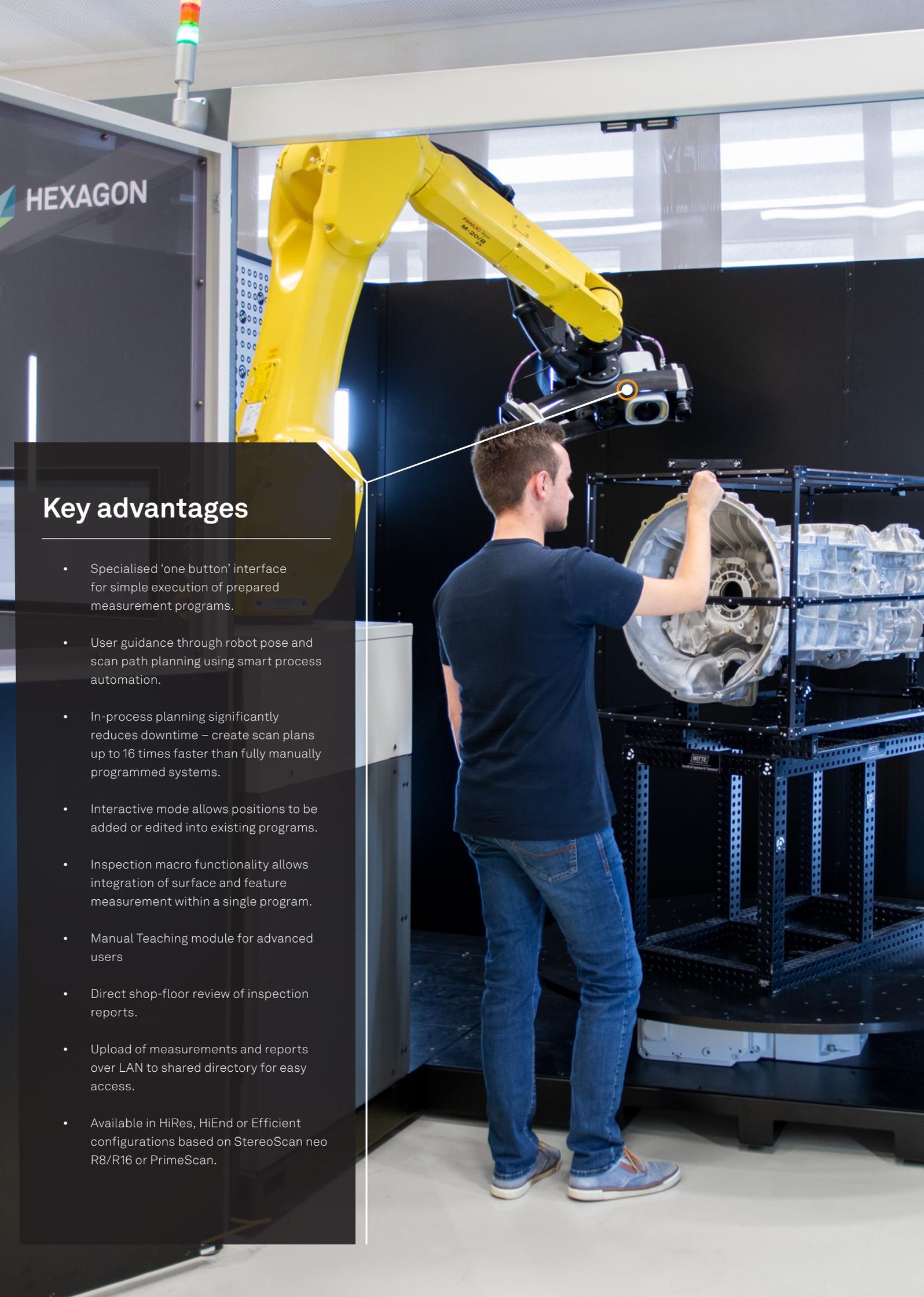
Smart Data Capture

The Smart Data Capture technology developed for all Hexagon structured light scanners powers data acquisition at extremely high speeds while maintaining high data quality. It also allows for the varying of measurement resolution as required by the demands of the specific application.

Configuration options

Depending on the required resolution and precision, different camera resolutions and measuring fields are available for the PrimeScan. Eight fixed configurations are available, allowing users to select the perfect tool for their particular measurement task.





HEXAGON

Key advantages

- Specialised 'one button' interface for simple execution of prepared measurement programs.
- User guidance through robot pose and scan path planning using smart process automation.
- In-process planning significantly reduces downtime – create scan plans up to 16 times faster than fully manually programmed systems.
- Interactive mode allows positions to be added or edited into existing programs.
- Inspection macro functionality allows integration of surface and feature measurement within a single program.
- Manual Teaching module for advanced users
- Direct shop-floor review of inspection reports.
- Upload of measurements and reports over LAN to shared directory for easy access.
- Available in HiRes, HiEnd or Efficient configurations based on StereoScan neo R8/R16 or PrimeScan.

PartInspect

Advanced automation made simple

Pairing a premium structured light scanner with a powerful robot arm for automated inspection offline, near-line or at-line, PartInspect offers straight-forward measurement cells that simplify and accelerate repetitive inspection tasks. A unique combination of automated scan planning and manual fine tuning delivers unmatched flexibility to the user, supported by an easy-to-use kiosk interface that allows for simple cell control right on the shop floor.

With PartInspect, project planning and execution requires no expert knowledge of robot teaching, allowing for simple automation that can be operated with minimal training. This all adds up to a range of high-end automated measurement systems that move vital inspection processes into the world of smart manufacturing with the minimum of expertise and effort.

OfflineProgramming

The PartInspect OfflineProgramming software tool allows for a wide range of measurement preparation functionality within an easy-to-learn user interface. The system takes the complexities of robot teaching out of the hands of the shop-floor user while also assisting advanced users through an intelligent guidance process.

ScanControl

On the shop floor, measurement is controlled through a touchscreen kiosk interface powered by the PartInspect ScanControl software. This allows the user to select and launch predefined measurement programs and means the standard user need never interact with the robot teach panel.

For advanced users, the Manual Teaching module within ScanControl allows for direct alterations to predefined measurement plans, making it easy to fine tune programs to ensure accurate and complete measurement at the first pass.



PartInspect configurations

Advanced automation made simple

PartInspect is available in three turnkey cell configurations, with each built on a different model from Hexagon's range of structured light scanners. Each cell is equipped with a touchscreen kiosk interface and a range of climate control sensors as standard.

PartInspect L HiRes

The flagship PartInspect turnkey cell is the PartInspect L HiRes, powered by the high-resolution sensor and digital projection technology of the StereoScan neo R16. The system has three field-of-view options, which can be selected as needed by the user, allowing for measurement of small-to-large parts with a single system. With X,Y resolution to within just 58 microns and scan accuracy to within 10 microns, the HiRes system is the pinnacle of automated structured light scanning solutions.

PartInspect L HiEnd

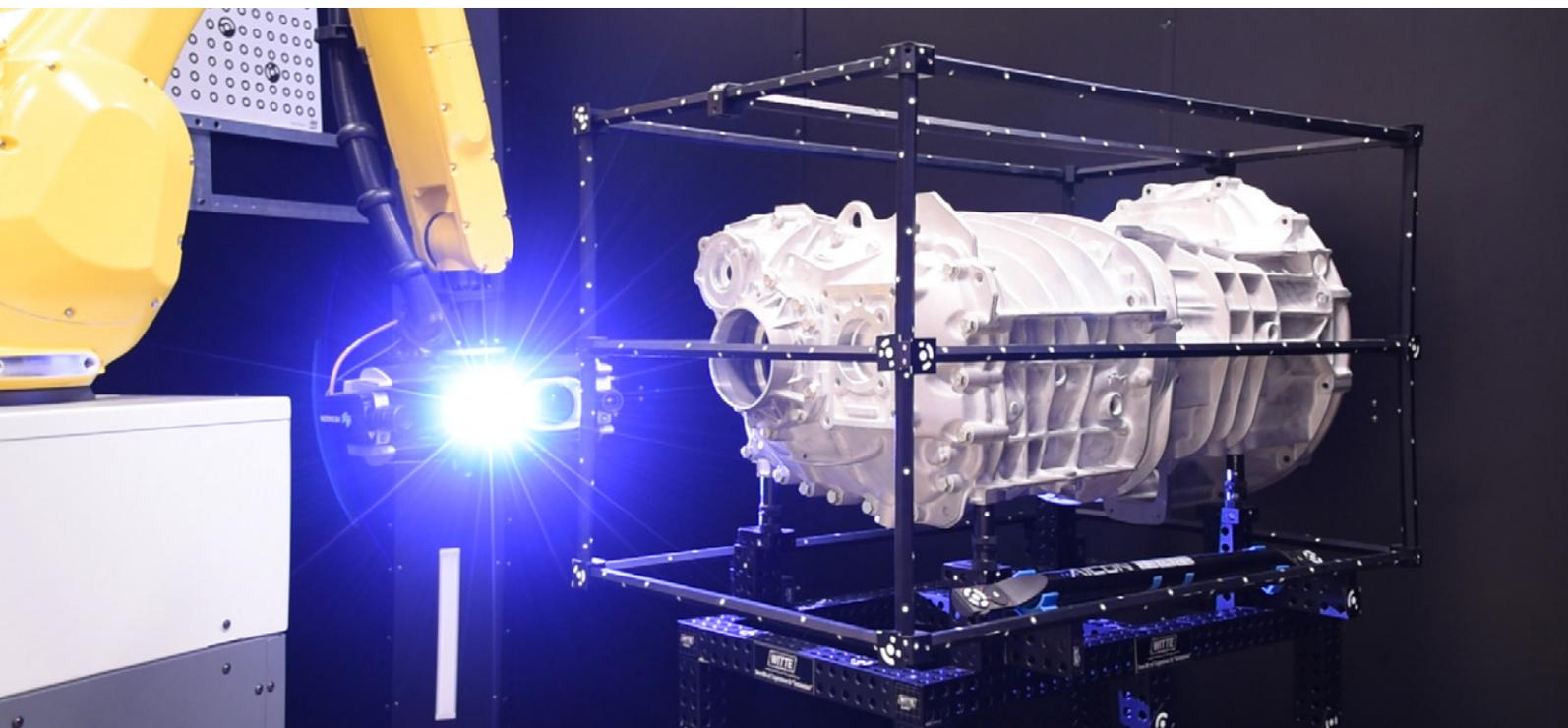
The PartInspect L HiEnd is equipped with a StereoScan neo R8 structured light scanner which allows for X,Y resolution to within 86 microns and extremely high measurement accuracy of to within 10 microns. As with the HiRes system, PartInspect HiEnd has three user-selectable field-of-view options that allow the single system to cover a wide range of part sizes.

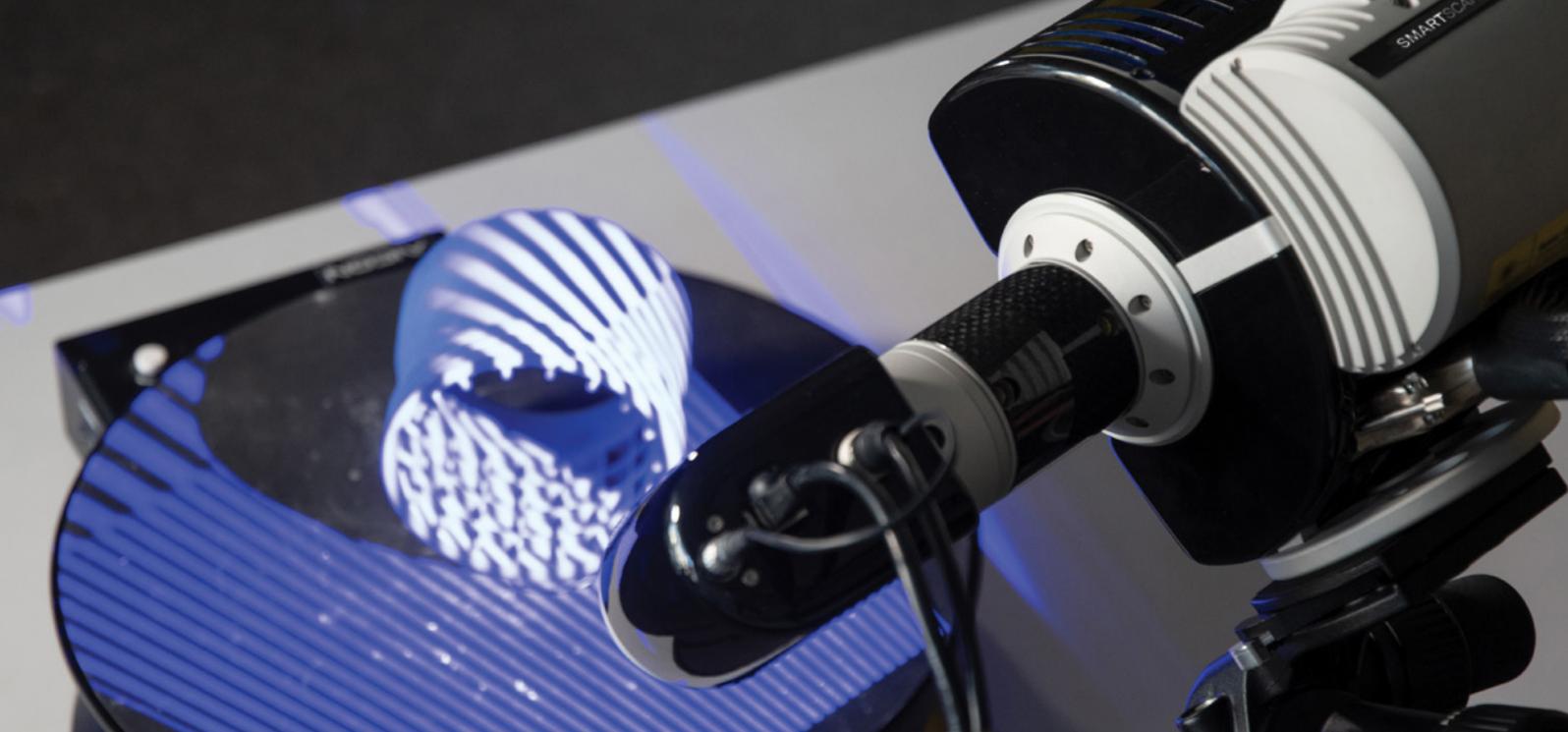
PartInspect L Efficient

PartInspect L Efficient is equipped with the economically priced sensor technology of the PrimeScan and comes with all necessary software features for automated 3D measurement of object surfaces at a high accuracy level of to within just 20 microns. The system is available with a choice of two field-of-view options for measuring small or large parts.

PartInspect custom

The Manual Teaching module within the PartInspect ScanControl software allows advanced users with specific automation needs to configure a custom PartInspect setup. By working with an experienced integrator, users can define an automated structured light inspection system tailored to their exact requirements.





Simple automation

Turntables and turn-tilt units for complete measurement productivity

An alternative to complex robot-based automation solutions can be achieved through the combination of structured light scanning technology with turntable or turn-tilt units. These productivity enhancing accessories allow a scanner to access every side of the measurement object without repositioning – all relevant areas of the object can be captured while minimising the number of single exposures.

- Semi-automated, highly precise inspection and digitisation of small-to-medium sized components.
- Highly repeatable accuracy enables a usefully reproducible process.
- Cost-effective and flexible alternative to a robot automation system.
- Portable system with minimal training requirements.
- Significant reduction in maintenance costs compared to full automation systems.

DPA Series

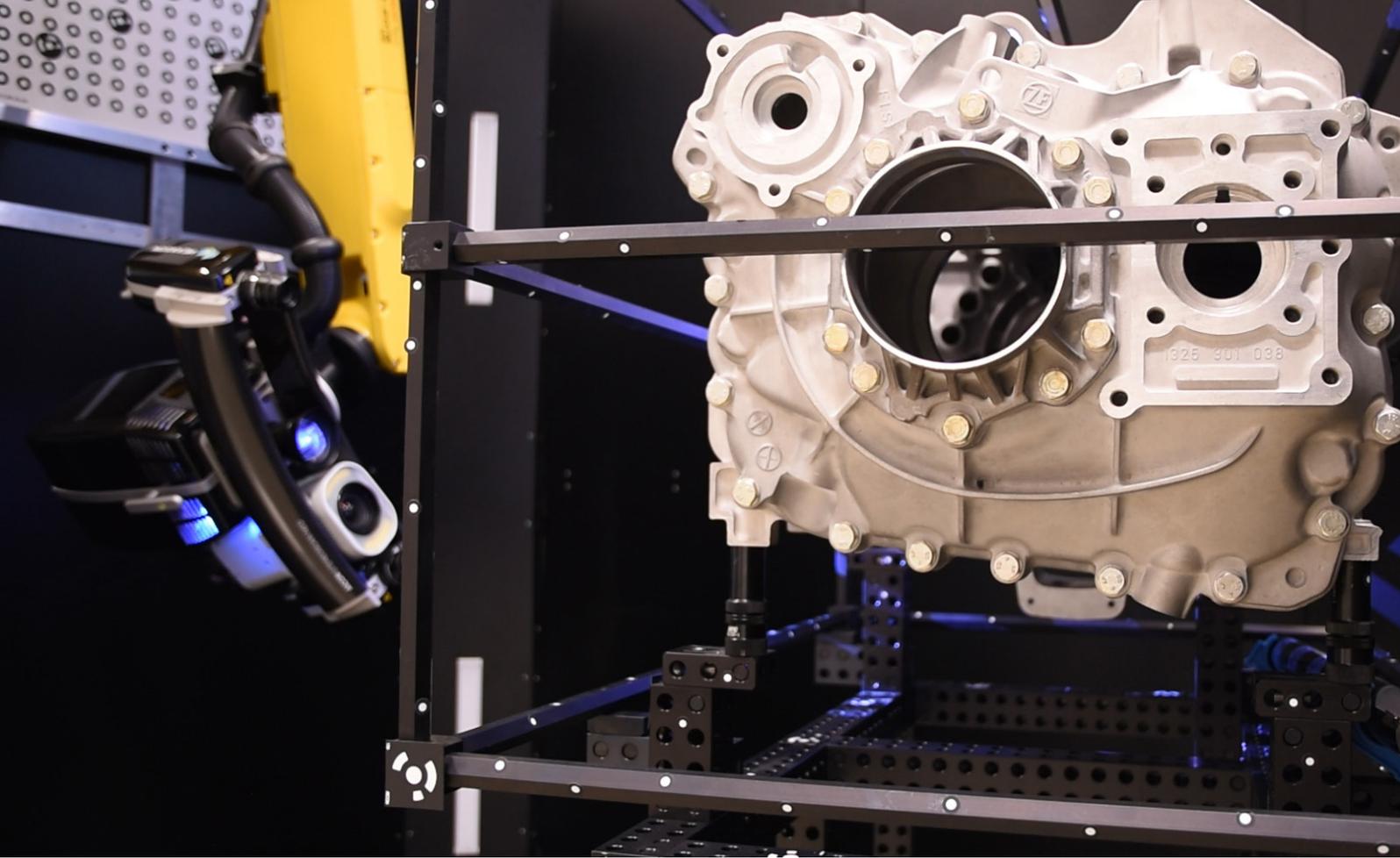
Photogrammetry meets structured light

Combining leading structured light scanning and photogrammetry technology is an unrivalled way to achieve high-accuracy 3D digitisation results on large measurement objects.

The measuring volume captured in a single scan by a Hexagon structured light scanner ranges from a few millimetres to about one metre across. By combining this technology with a photogrammetry system from the DPA Series, considerably larger freeform areas can also be captured at the highest level of detail. This add-on technology combination provides more reliable and much more precise global coordinates in the component's coordinate system, allowing for accurate measurement across a greater volume.

- Targets are used to signalise reference points on the object.
- A digital camera takes photos from a variety of directions and angles.
- From this data, a point cloud that can be used as a reference system is created.
- Single surface scans are made by a structured light scanner
- The scan data is then matched into the reference system.





DPA Online

Automated photogrammetry integration

Part of the DPA Series of photogrammetry technology, DPA Online is an add-on photogrammetry module for PartInspect L cells. A high-resolution camera is mounted on or beneath the scanner and used to generate a reference frame to control global alignment precision on large and/or complex parts.

- Strengthens measurement geometry and ensures a standardised level of accuracy.
- Guarantees accuracy to within 50 microns throughout the entire cell measurement volume.
- Aimed at difficult to measure parts, such as flat, thin or very large objects.
- Photogrammetry is fully integrated into the workflow of PartInspect measurement projects.
- Includes robot programs customised for photogrammetry for each PartInspect L configuration.
- Available for all PartInspect L configurations at time of initial installation or as a later upgrade.

OptoCat

Modules

Standard modules	
Calibration	Calibration of the scanner using a certified reference.
Contour Matching	Alignment of the individual scans via object geometry.
Target Matching	Alignment of the individual scans via target, with or without photogrammetry.
Semi-Automatic Scanning	With a turntable or a turn-tilt unit.
Data Processing	Hole filling, compressing, filtering.
Basic Inspection Functionalities	Basic functions for data analysis and data comparison. Various alignment strategies: automatic and manual pre-alignment; shape alignment using Best-Fit; Best-Fit via reference points; 3-2-1; plane-line-point.

Add-on modules	
Ext. Ref. Matching (DPA add-on)	Photogrammetry for precise recognition of targets and for alignment with predefined reference point clouds.
MI.Probing	For tactile measurements with the MI.Probe mini, supplied with MI.Probe accessories.
CAD Data Import	Importing of various CAD formats: STEP, IGES, Catia V4, V5, V6.
Back Projection	Colour back projection of test results and information onto the measurement object with StereoScan neo.
Texture Mapping	Capturing and transfer of the texture (colour and pattern) of an object to its scanned 3D data.

Other functions

- Data import: STL, PLY, CTR, IGES | IGS, STEP | STP, PRT, MODEL, VDA, OBJ, ASCII | ASC, SDF
- Data export: STL, PLY, CTR, OBJ, ASCII | ASC, SDF
- Inspection functions, scalable false colour depiction for data comparison, fitting and comparison with various basic shapes (e.g. plane, cylinder, sphere)
- Construction: multi-cuts, distances, angles
- Various user levels available
- Interface with PC-DMIS, Inspire, PolyWorks® and Geomagic Control X for automatic inspection
- Interface with VISI Reverse and Geomagic Design X for reverse engineering

OptoCat

A dedicated scanning software solution

From 3D scanner calibration and data capture through to post-processing and evaluating measurement data, OptoCat is all the software needed for three-dimensional surface measurement. Featuring a diverse range of metrology functions, the innovative OptoCat modular software package allows users to develop a personally configured setup best suited to the needs of their specific measurement task.

Within the software, individual scans are automatically aligned and merged, with or without photogrammetric targets. The program uses intelligent algorithms to evaluate the geometric and radiometric features of the scanned object, so there is no longer any need to align the individual scans to each other manually.

Built-in OptoCat functions make it easier to post-process captured 3D data, including functions such as flattening, compressing and optimising meshes, texturing, and data export. In addition to performing its own inspection, the program has the option to link directly to a variety of leading third-party metrology software platforms for an optimised, interactive and/or automatic evaluation.

Measurement results can be compared directly or to imported CAD data. The software offers various functions for data analysis, edge extraction and other post-processing steps. Scan data can also be exported into a variety of formats for further processing.

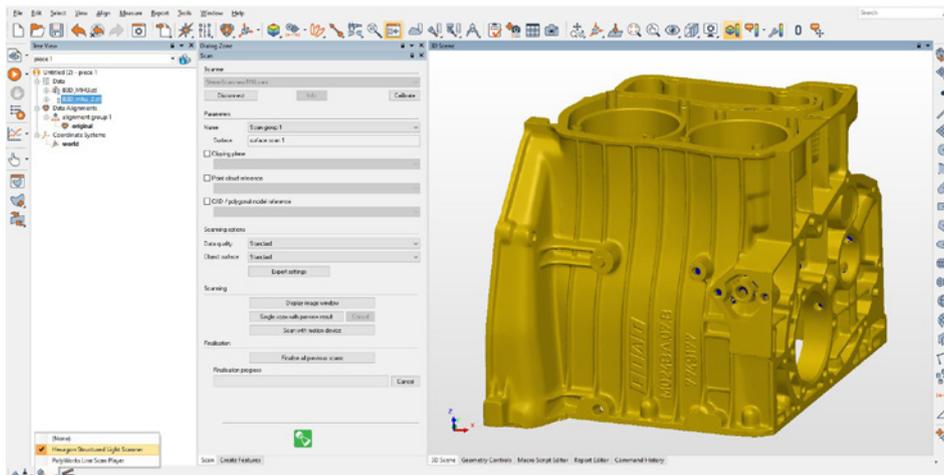
SLS SDK

Deep third-party integration

Our structured light scanner software development kit (SDK) was developed to allow for the deep integration of key functionalities of Hexagon's range of structured light scanners within the leading third-party metrology software platforms on the market.

The first result of the publication of this SDK is the SLS-PW Plug-in, an add-on for PolyWorks developed in cooperation with publisher Innovmetric.

The SLS-PW Plug-in and any subsequently developed plug-ins will let users streamline their scanning and inspection workflow into a single software environment, with clear productivity benefits. The increased efficiency of a single platform workflow will reduce inspection times by eliminating the need to export and import measurement data between separate programs, as well as by minimising training needs.



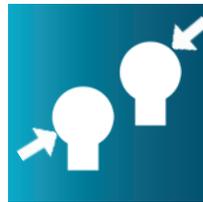
Defining accuracy

Having a reliable basis for the stated accuracy of our structured light scanning systems is vital. That's why we measure every scanner against our defined Scanner Acceptance Test. Based on VDI/VDE Guideline 2634 Part 3, this Scanner Acceptance Test uses four clear quality parameters to ensure users have full confidence in the accuracy of their Hexagon structured light scanner.



Sphere spacing error [SD]

Global quality parameter. Deviation from distance of fitted spheres to calibrated distance.



Length measuring error [E]

Global quality parameter. The deviation of the nearest points along the centre axis.



Probing error form [PF]

Local quality parameter. Deviation from the surface to a fitted sphere.



Probing error size [PS]

Local quality parameter. Deviation from the fitted sphere radius to the calibrated radius.



Technical specifications

Scanner configurations



	StereoScan neo R8	StereoScan neo R16	SmartScan R5	SmartScan R12	PrimeScan R5	PrimeScan R8
Camera sensor	Monochrome, CCD progressive scan 4/3"	Monochrome, CCD progressive scan, full format 1.7"	Monochrome CMOS, 2/3"	Monochrome CMOS, 1.1"	Monochrome, CMOS 2/3"	Monochrome, CCD 1"
Camera resolution	8.0 MP 2 x 8 147 712 px 3296 x 2472	16.0 MP 2 x 15 720 448 px 4864 x 3232	5.0 MP 2 x 5 013 504 px 2448 x 2048	12.0 MP 2 x 12 368 896 px 4112 x 3008	5.0 MP 2 x 5 013 504 px 2448 x 2048	8.0 MP 2 x 7 990 272 px 3264 x 2448
Projection unit	Digital projector		Miniaturised projection technique			
Light source	3 x 100 W high-power LEDs (red + green + blue)		100 W high-power LED (blue)			
Min. measuring time	1 s					
Sensor weight	12 kg*		4 kg		3.8 kg	
Power supply	AC 110/230 V, 50-60 Hz, 600 W		AC 110/230 V, 50-60 Hz, external, 150 W			
Control unit	Integrated, USB 3.0		External, USB 2.0		Integrated, USB 3.0	
Operating system	Windows 10, 64 Bit					
Probing	Compatible with MI.Probe mini					

*Weight may vary depending on the measuring fields.

Measurement specifications

StereoScan neo

R8 models

Outer camera position	Triangulation angle: 30° Base length: 450 mm Working distance: 840 mm			
Field of view ⁽¹⁾	L - 350 mm	L - 550 mm	L - 850 mm	L - 1100 mm
Field of view size ⁽¹⁾	280 x 210 mm	420 x 320 mm	700 x 560 mm	850 x 700 mm
Measuring depth ⁽³⁾	176 mm	270 mm	430 mm	550 mm
X, Y resolution ⁽⁴⁾	86 µm	128 µm	211 µm	256 µm
Sphere spacing error	10 µm	16 µm	30 µm	42 µm
Length measuring error	20 µm	28 µm	60 µm	84 µm
Probing error size	6 µm	12 µm	16 µm	21 µm
Probing error form	7 µm	12 µm	16 µm	18 µm

Inner camera position	Triangulation angle: 30° Base length: 150 mm Working distance: 350 mm		
Field of view ⁽¹⁾	S - 75 mm	S - 125 mm	S - 200 mm
Field of view size ⁽²⁾	65 x 50 mm	100 x 75 mm	160 x 125 mm
Measuring depth ⁽³⁾	36 mm	60 mm	100 mm
X, Y resolution ⁽⁴⁾	20 µm	30 µm	49 µm
Sphere spacing error	5 µm	6 µm	8 µm
Length measuring error	10 µm	15 µm	18 µm
Probing error size	4 µm	6 µm	6 µm
Probing error form	5 µm	6 µm	6 µm

R16 models

Outer camera position	Triangulation angle: 30° Base length: 450 mm Working distance: 840 mm			
Field of view ⁽¹⁾	L - 350 mm	L - 550 mm	L - 850 mm	L - 1100 mm
Field of view size ⁽²⁾	285 x 190 mm	460 x 310 mm	710 x 500 mm	940 x 700 mm
Measuring depth ⁽³⁾	176 mm	280 mm	430 mm	550 mm
X, Y resolution ⁽⁴⁾	58 µm	94 µm	146 µm	193 µm
Sphere spacing error	10 µm	16 µm	30 µm	32 µm
Length measuring error	20 µm	28 µm	60 µm	64 µm
Probing error size	6 µm	12 µm	16 µm	18 µm
Probing error form	7 µm	12 µm	16 µm	18 µm

Inner camera position	Triangulation angle: 30° Base length: 150 mm Working distance: 350 mm		
Field of view ⁽¹⁾	S - 75 mm	S - 125 mm	S - 200 mm
Field of view size ⁽²⁾	70 x 50 mm	90 x 60 mm	160 x 110 mm
Measuring depth ⁽³⁾	20 mm	54 mm	100 mm
X, Y resolution ⁽⁴⁾	15 µm	19 µm	33 µm
Sphere spacing error	5 µm	6 µm	8 µm
Length measuring error	8 µm	15 µm	18 µm
Probing error size	4 µm	6 µm	6 µm
Probing error form	5 µm	6 µm	6 µm

All StereoScan neo and SmartScan fields of view (FOV) can be realised by using the same fundamental components, i.e. the system base, cameras and projection unit, through a simple change of the objectives (and of the CRP base, if necessary). In order to simplify the setup and calibration of the standard measuring ranges, they will only be provided with an individually prepared and tested set of lenses for each FOV. The lenses are delivered with a predefined factory setting for the aperture and focal depth, which are optimised for the corresponding FOV and do not need to be altered by the user.

Measurement specifications

SmartScan

R5 models

	Triangulation angle: 27° Base length: 470 mm Working distance: 1000 mm			
Field of view ⁽¹⁾	M - 125 mm	M - 200 mm	M - 500 mm	M - 850 mm
Field of view size ⁽²⁾	105 x 85 mm	160 x 130 mm	380 x 310 mm	650 x 565 mm
Measuring depth ⁽³⁾	66 mm	100 mm	244 mm	420 mm
X, Y resolution ⁽⁴⁾	43 µm	64 µm	153 µm	266 µm
Sphere spacing error	10 µm	11 µm	22 µm	44 µm
Length measuring error	20 µm	22 µm	44 µm	88 µm
Probing error size	7 µm	9 µm	11 µm	22 µm
Probing error form	7 µm	8 µm	11 µm	22 µm

	Triangulation angle: 30° Base length: 240 mm Working distance: 370 mm		Triangulation angle: 20° Base length: 470 mm Working distance: 1500 mm	
Field of view ⁽¹⁾	S - 60 mm	S - 125 mm	L - 750 mm	L - 1550 mm
Field of view size ⁽²⁾	50 x 40 mm	100 x 80 mm	560 x 470 mm	1200 x 750 mm
Measuring depth ⁽³⁾	30 mm	60 mm	360 mm	750 mm
X, Y resolution ⁽⁴⁾	20 µm	40 µm	230 µm	485 µm
Sphere spacing error	5 µm	7 µm	61 µm	220 µm
Length measuring error	10 µm	14 µm	122 µm	440 µm
Probing error size	6 µm	7 µm	31 µm	110 µm
Probing error form	5 µm	7 µm	31 µm	110 µm

R12 models

	Triangulation angle: 27° Base length: 470 mm Working distance: 1000 mm			
Field of view ⁽¹⁾	M - 350 mm	M - 450 mm	M - 750 mm	M - 1000 mm
Field of view size ⁽²⁾	285 x 205 mm	380 x 275 mm	590 x 435 mm	825 x 630 mm
Measuring depth ⁽³⁾	180 mm	240 mm	370 mm	500 mm
X, Y resolution ⁽⁴⁾	69 µm	92 µm	143 µm	201 µm
Sphere spacing error	16 µm	20 µm	30 µm	44 µm
Length measuring error	36 µm	40 µm	60 µm	88 µm
Probing error size	9 µm	10 µm	15 µm	22 µm
Probing error form	9 µm	10 µm	15 µm	22 µm

	Triangulation angle: 29° Base length: 260 mm Working distance: 500 mm			
Field of view ⁽¹⁾	SL - 90 mm	SL - 200 mm	SL - 300 mm	SL - 500 mm
Field of view size ⁽²⁾	70 x 55 mm	145 x 105 mm	240 x 160 mm	420 x 325 mm
Measuring depth ⁽³⁾	44 mm	90 mm	144 mm	250 mm
X, Y resolution ⁽⁴⁾	17 µm	35 µm	57 µm	102 µm
Sphere spacing error	6 µm	9 µm	12 µm	21 µm
Length measuring error	15 µm	18 µm	24 µm	42 µm
Probing error size	6 µm	6 µm	8 µm	15 µm
Probing error form	6 µm	6 µm	8 µm	15 µm

⁽¹⁾ Designation of the scanner bases (S, L) and the diagonal in the centre of the measuring volume.

⁽²⁾ Lateral expansion (X x Y) in the centre of the measuring volume.

⁽³⁾ Depth of the measuring volume (Z).

⁽⁴⁾ The values for the lateral resolution have been calculated theoretically (ratio of the size of the FOV and number of pixels of the camera chip).

Measurement specifications

PrimeScan

R5 models

	Short working distance Triangulation angle: 26° Working distance: 370 mm			Long working distance Triangulation angle: 18° Working distance: 540 mm	
Field of view ⁽¹⁾	50 mm	125 mm	200 mm	400 mm	700 mm
Field of view size ⁽²⁾	40 x 30 mm	100 x 80 mm	150 x 125 mm	300 x 275 mm	500 x 450 mm
Measuring depth ⁽³⁾	24 mm	64 mm	100 mm	200 mm	350 mm
X, Y resolution ⁽⁴⁾	16 µm	40 µm	63 µm	125 µm	208 µm
Sphere spacing error	4 µm	7 µm	12 µm	20 µm	56 µm
Length measuring error	10 µm	16 µm	24 µm	40 µm	112 µm
Probing error size	6 µm	6 µm	6 µm	10 µm	28 µm
Probing error form	4 µm	6 µm	7 µm	10 µm	28 µm

R8 models

	Short working distance Triangulation angle: 26° Working distance: 370 mm		Long working distance Triangulation angle: 18° Working distance: 540 mm
Field of view ⁽¹⁾	100 mm	450 mm	650 mm
Field of view size ⁽²⁾	80 x 60 mm	350 x 290 mm	500 x 400 mm
Measuring depth ⁽³⁾	50 mm	222 mm	320 mm
X, Y resolution ⁽⁴⁾	27 µm	109 µm	155 µm
Sphere spacing error	6 µm	25 µm	52 µm
Length measuring error	14 µm	50 µm	104 µm
Probing error size	8 µm	13 µm	26 µm
Probing error form	6 µm	13 µm	26 µm

All PrimeScan fields of view (FOV) are an integral part of the system: their configuration cannot be changed. Each field of view is delivered as a separate device.

⁽¹⁾ Designation of the scanner bases (S, L) and the diagonal in the centre of the measuring volume.

⁽²⁾ Lateral expansion (X x Y) in the centre of the measuring volume.

⁽³⁾ Depth of the measuring volume (Z).

⁽⁴⁾ The values for the lateral resolution have been calculated theoretically (ratio of the size of the FOV and number of pixels of the camera chip).



PartInspect L specifications

PartInspect L cell specifications

Maximum part height	1500 mm
Maximum part diameter	1500 mm
Maximum part load on turntable	2000 kg
Industrial robot Max. payload Reach	25 kg 1853 mm
Voltage range (different regions)	400 Y/230 V AC (+/-5%), 16 A 50/60 Hz or US/C 480 Y/277 V AC, 120 V AC 60 Hz
Input power	5 kVA
Average power consumption	1.5 kW
Housing dimensions	W 3050 x D 2480 x H 2500 mm
Maximum door opening width	1670 mm
Cell weight	2500 kg
Required ceiling height	3500 mm
Required floor load capacity	400 kg/m ²

PartInspect L configuration specifications

	PartInspect L HiRes StereoScan neo R16	PartInspect L HiEnd StereoScan neo R8	PartInspect L Efficient PrimeScan R5
Field of view	FOV L-350/550/850		FOV 400/700
Camera sensor	Monochrome, CCD progressive scan, full format 1.7"	Monochrome, CCD progressive scan 4/3"	Monochrome, CMOS 2/3"
Camera resolution	16 MP 2 x 15 720 448 px 4864 x 3232	8 MP 2 x 8 147 712 px 3296 x 2472	5 MP 2 x 5 013 504 px 2448 x 2048
Projection unit	Digital projector		Miniaturised projection technique
Light source	3 x 100 W high-power LEDs (red + green + blue)		100 W high-power LED (blue)
Minimum measuring time	1 s		
Sensor weight	12 kg ⁽¹⁾		3.8 kg
Power supply	AC 110/230 V, 50-60 Hz, 600 W		AC 110/230 V, 50-60 Hz, external, 150 W
Control unit	Integrated, USB 3.0		
Operating system	Windows 10, 64 Bit		

DPA Online accuracy

Length measurement accuracy	MPE ⁽²⁾ 20 µm + 20 µm/m (diagonal length of measurement volume)
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⁽¹⁾ Weight may vary depending on the measuring fields.

⁽²⁾ Maximum Permissible Error of length measurement accuracy, based on VDI/VDE 2634 part 1: defined as maximum permissible deviation of a measured length, which is located between two measuring points, signalised with photogrammetric targets, in the entire measuring volume of PartInspect L, regardless of position and orientation.

Service and support

World-class products to rely on

Drawing on decades of research and development experience, structured light and photogrammetry technology from Hexagon's Manufacturing Intelligence division is built on a long history of outperforming technological innovation. Deriving quality from experience to drive productivity is what keeps Hexagon in front and able to deliver first-class solutions for industries around the world.

That's why every major structured light scanning product in this brochure comes with a 12-month factory warranty as standard, as well as a guaranteed 10 years of serviceability through official Hexagon service channels.

World-class support delivered locally

The international presence of Hexagon guarantees comprehensive aftersales support and services across the globe. With the largest dedicated service team of any metrology equipment manufacturer and an emphasis on locally delivered solutions, Hexagon is unmatched from service, repair, certification and calibration through operator training and software maintenance and upgrades.



● Customer and demo centre ○ Production facility

World-class service made simple

Hexagon offers a wide range of support services extending well beyond the point of purchase. Delivered by experienced and skilled engineers at ISO-certified laboratories, local Hexagon Precision Centres or even on-site to minimise downtime, our after-sales portfolio is the most complete on the market.

- Maintenance and warranty plans that ensure equipment availability.
- Trouble-free usage and minimal downtime.
- Preferred hotline access at no additional cost.
- Access to professional advice whenever needed.

Customer Care Packages

Owners of the Hexagon structured light scanning and photogrammetry products featured in this brochure also have the opportunity to invest in a Customer Care Package designed to ensure equipment remains in top condition and can be relied on for accurate measurement results throughout a lifetime of use.

Customer Care Packages include a selection of the following benefits, depending on the tier chosen.

	Platinum	Gold	Silver	Bronze
Planned annual service	✓	✓	✓	✓
Customer hardware support	✓	✓	✓	
Software support and software updates	✓	✓	✓	
Annual maintenance and recertification	✓	✓		
Remote connected assistance	✓	✓		
Repair parts and labour	✓			
Customised local benefits	✓	✓	✓	✓

For complete details of the benefits of each level of Customer Care Package, please contact a local Hexagon representative.



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).