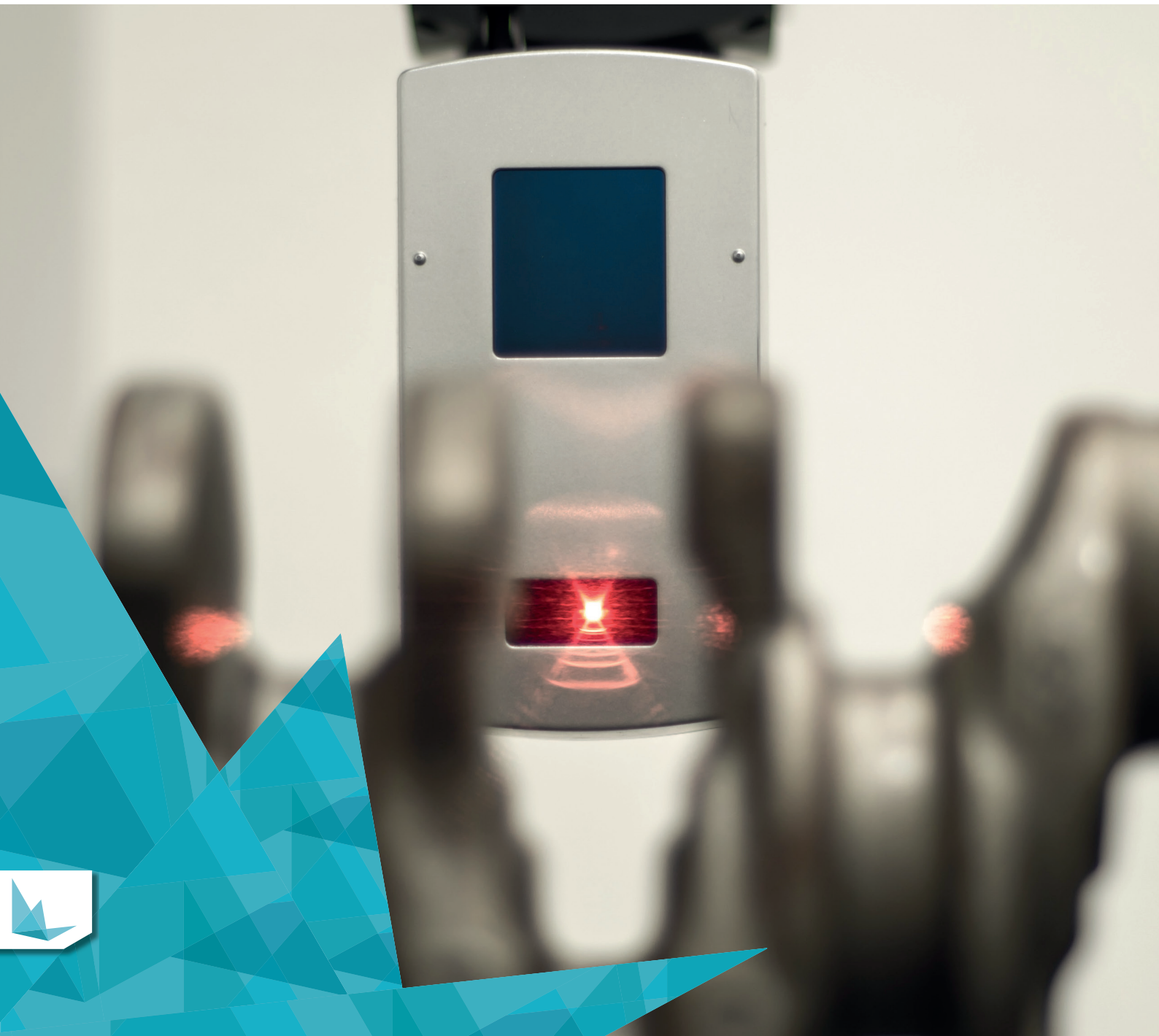
HEXAGON
MANUFACTURING INTELLIGENCE

PRODUCT BROCHURE

LASER SCANNERS FOR CMMs

HP-L-5.8 | HP-L-10.6 | HP-L-20.8

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BRINGING THE SPEED AND VERSATILITY OF LASER SCANNING TO CMMs

HP-L laser scanning sensors deliver maximum performance for complex surfaces and workpieces made of materials that are difficult to measure, operating precisely at the highest speeds.

Equipped with HP-L laser scanning, CMMs turn into multisensor machines that combine traditional tactile probing with optical measurements, such as surface capture or optical feature measurement, in a single part program.

Applications that benefit from laser scanning include checking the characteristics of thin-walled components and sheet metal parts; measuring freeform surfaces; and reverse engineering.

BENEFITS OF HP-L LASER SCANNERS:

- **Reliable measurement of complex surfaces**
  HP-L scanning sensors are suitable for measuring almost any material, including machined, semi-finished, stamped, forged, cast, painted metals, sand cores, carbon fibre, plastics, clay, rubber, wood and ceramics.
- **Fully compatible with probe changers for multisensor measurement**
  A multisensor CMM combines high-accuracy probing with non-contact measurements. Changes within the process, such as powder-spraying or part loading and unloading, are no longer necessary.
- **Accuracy you can trust**
  The sensors comply with the latest ISO 10360-8:2013 standard for optical distance sensors.
- **Automatic identification of features from the point cloud in PC-DMIS CAD++**
  Feature extraction using PC-DMIS CAD++ software enables users to combine tactile measurements with automated feature measurements from the point clouds captured with HP-L laser scanners.


HP-L-5.8

HP-L-5.8

ENTERING THE WORLD OF LASER SCANNING

The HP-L-5.8 laser scanning sensor makes it easy and affordable to begin creating point clouds on a CMM. The fixed-line blue laser can measure a wide range of surfaces, from very dark through to very shiny. The rugged and compact design makes it ideal for laser scanning on smaller CMMs and where accessibility is restricted.

The HP-L-5.8 is equipped with Hexagon's Kinematic Joint, making it compatible with existing Hexagon probe heads and accessories, including automatic sensor changing racks or extensions.

BENEFITS OF THE HP-L-5.8 LASER SCANNER:

- Blue line laser scanning
  The fixed-line blue laser makes it possible to capture 900 points per line, with a measurement frequency of up to 40Hz or 36,000 points per second.
- Rugged and compact design
  HP-L-5.8's rugged design protects its parts from collisions and vibrations. Its compact size and its short nominal working distance from the surface of between 100mm and 180mm mean it is particularly well-adapted for use with small CMMs and where accessibility is restricted.

HP-L-10.6 | HP-L-20.8

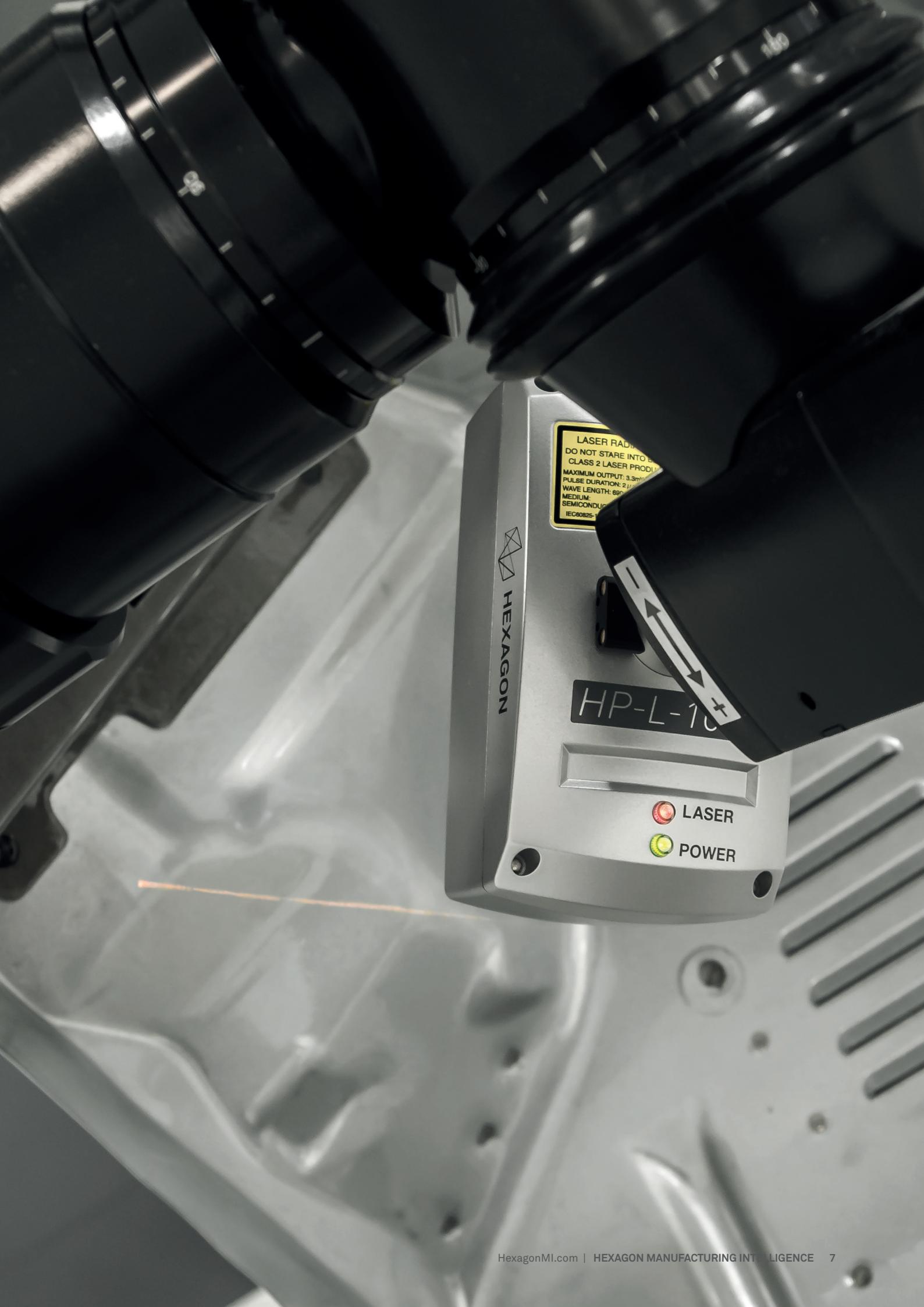
FLEXIBLE LASER SCANNERS FOR CHALLENGING APPLICATIONS

The HP-L-10.6 relies on flying-dot technology, which is superior to conventional line scanning because it automatically adjusts light intensity point by point. This means the laser scanners are less sensitive to ambient light and surface changes and generate point clouds of the highest density.

In addition, the line width can be varied as needed from 24 mm to 124 mm (HP-L-10.6) and up to 220 mm for the HP-L-20.8. with the point-to-point distance depending on the chosen line width.

BENEFITS OF THE HP-L-10.6 AND HP-L-20.8 LASER SCANNERS:

- **Generates high-quality point-cloud data**
  Real-time laser power control automatically adjusts the light intensity. This unique technology allows the laser intensity to be optimised 10 times during the measurement of every single point.
- **Variable optical resolution and user-selectable line length**
  Perfect for quick surface inspections of large areas or the measurement of small isolated features, HP-L offers a real zoom feature by varying the spaces between the individual dots, not just clipping the line on each end.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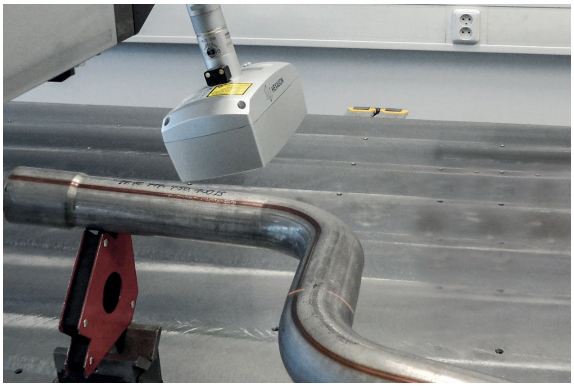
POWER

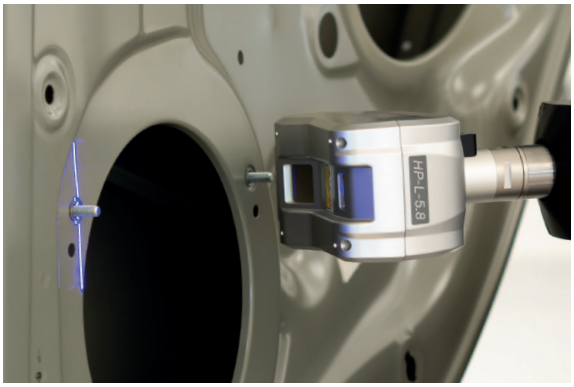
SAVE TIME WITH FAST, ACCURATE AND CONTACTLESS MEASUREMENT



NEW WAYS TO INSPECT TUBE BENDING

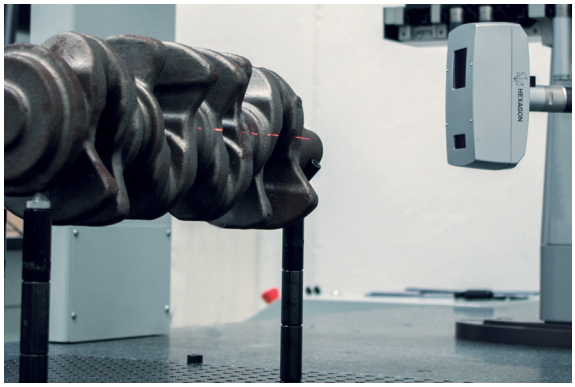
Tube bending is just one example of a process where inspection requirements have become more rigorous. It's no longer enough for many manufacturers to compare intersection points between two straight lengths.

The HP-L range of scanners' high-density point cloud creation enables manufacturers to conduct more in-depth inspection by analysing tube shape deviations on the cross-sections at any specific location of a tube. It also reveals the shape imperfections against the CAD model by scanning the cylindrical surface of the tube.



SCANNING IRREGULAR SHAPES

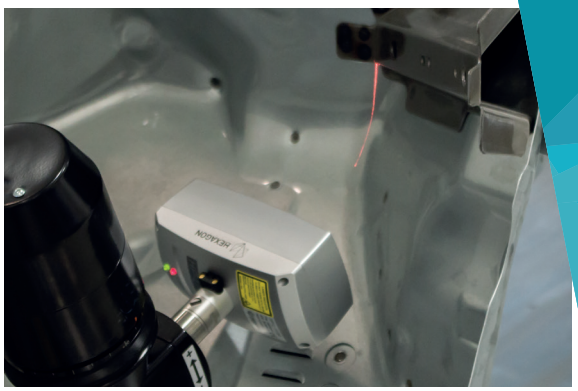
Inspecting large numbers of objects with irregular shapes and surfaces can be slow work for tactile probes, but not for laser scanners. Measuring the welded studs on a car body is just one example of a process that laser scanners can perform more quickly. One of Hexagon's customers succeeded in reducing the time it took to measure connecting pins on a car body from three hours with a tactile probe to just 20 minutes with a laser scanner.



GETTING THE BIG PICTURE QUICKLY

Some complex parts, such as an unmachined crankshaft, require a tactile probe to take hundreds of tactile measurement points to build up a full inspection picture.

The contactless HP-L laser scanner range can create an easy-to-read, coloured report that gives a clear overview of a part's quality. It compares results from all over the surface, not just single points, allowing users to more quickly analyse information.



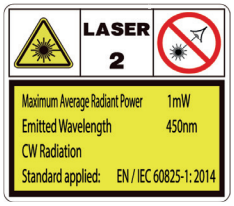
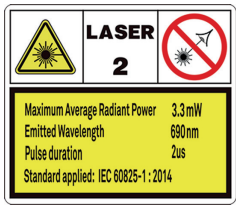
MAKING LIGHT WORK OF LARGE SURFACES

The trimmed edges of most sheet metal parts are analysed with the help of measurements made by touch probes. But for larger parts, this generates an enormous amount of measurement points that are time-consuming to analyse.

The HP-L laser scanner range works more rapidly than a touch probe by capturing a single scanning path along the edge and extracting the measurements afterwards. As a result, the time it takes a tactile probe to capture 300 tactile measurement points can be reduced to only 15 minutes from as much as an hour by using a HP-L laser scanning sensor.

TECHNICAL DATA

HP-L LASER SCANNING SENSORS

	HP-L-5.8	HP-L-10.6	HP-L-20.8
Laser protection class	2 (IEC 60825-1: 2014)	2 (IEC 60825-1: 2014)	2 (IEC 60825-1: 2014)
Laser	Visibly blue (450 nm)	Visibly red (690 nm)	Visibly red (690 nm)
Standoff and depth (Z)	140 ± 40 mm	170 ±30 mm	180 ± 40 mm
Measuring accuracy ISO 10360-8:2013* (GLOBAL CMM except GLOBAL eXtra)			
PForm.Sph.D95%:Tr:ODS (MPL) Probe dispersion value	34 µm	34 µm	36 µm
PForm.Sph.1x25:Tr:ODS (MPE) Probing form error	22 µm	22 µm	25 µm
Point Spacing (Min.)	53 µm	30 µm	13 µm
Laser Line Width (at mid-field)	47 mm	24 , 60 or 124 mm	25, 51, 63, 130 or 220 mm
Lines per second (max.)	40 Hz	53 Hz	100 Hz
Data rate (max.)	36 000 pts/sec	30 000 pts/sec	150 000 pts/sec
Ambient light immunity of the sensor	5 000 lx	40 000 lx	40 000 lx
Operating temperature	+5 to +45 °C (41 to 113° F)	+5 to +45 °C (41 to 113° F)	+5 to +45 °C (41 to 113° F)
Declared accuracy temperature range	+15 to +32 °C (59 to 90° F)	+15 to +32 °C (59 to 90° F)	+15 to +32 °C (59 to 90° F)
Relative humidity	90% non-condensing	90% non-condensing	90% non-condensing
Size L x W x H	HP-L-5.8T: 116x62x 86.5 (106.5) mm HP-L-5.8A: 116x62x81 (101) mm	HP-L-10.6T: 134x72x60 (98) mm HP-L-10.6A: 134x72x60 (87) mm	137x76x85 mm
Weight	360 g - 380 g	360 g - 379 g	410 g
Power supply	All HP-L Sensors: DC 18 to 28 V, 170 to 200 mA, protected against polarity reversal		
Protection against dust and water	All HP-L Sensors: IP64 (IEC 60529) (except for warm-up connection)		
Storage temperature	All HP-L Sensors: -25 to +70 °C (-13 to 158° F)		
Hardware Compatibility**	GANTRY CMMs | BRIDGE CMMs | HORIZONTAL ARM CMMs		
Laser Safety			

* Values are including expanded measurement uncertainty according ISO/TS 17865:2016.
Measured using a manufacturer supplied sphere- and plane artefact, each certified by an independent accredited lab.

** For further details, please see individual machine data-sheet

DOCUMENTED QUALITY WITH ISO CERTIFICATION AND RECALIBRATION

In the production process, the highest priority is the monitoring of quality by the appropriate instruments. HP-L laser scanners offer top performance when measuring complex surfaces and workpieces, even on materials that are difficult to measure. The reliability of the process, however, can only be achieved if the repeatability of the measurement results is constant.

To ensure long-term process monitoring, periodic recalibration or testing to ISO standards (as required) is recommended. Depending on customers needs as well as on the operational conditions of your measuring equipment, Hexagon offers the following service possibilities as the manufacturer:

ISO CERTIFICATION

The sensor will be checked according to ISO 10360-8:2013. This means that it is checked based on measurements on a sphere and on a plane. The results are made available in a certificate.

RECALIBRATION

Involves completing a factory routine that ensures the sensor performs measurements as a brand-new device would.

Please send us the request by fax, email or mail.
We will get in touch with you right away.

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The processing time is no more than four working days from receipt plus applicable shipping times.

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Hexagon Manufacturing Intelligence helps industrial manufacturers develop the disruptive technologies of today and the life-changing products of tomorrow. As a leading metrology and manufacturing solution specialist, our expertise in sensing, thinking and acting – the collection, analysis and active use of measurement data – gives our customers the confidence to increase production speed and accelerate productivity while enhancing product quality.

Through a network of local service centres, production facilities and commercial operations across five continents, we are shaping smart change in manufacturing to build a world where quality drives productivity. For more information, visit **HexagonMI.com**.

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