HP-O

MORE DATA, MORE QUICKLY

Non-contact measurement reaches a new dimension with HP-O, the high-speed optical sensor – all the accuracy and reliability of a tactile probe with increased measurement range and higher data collection rate.
View product videos free via our YouTube channel. http://hex.ag/zMTPN
Innovation is a particularly human concept. Always looking for new ways to do things – the fastest, the highest, the largest – we strive for that bit more. It’s how we’ve progressed over several centuries and continue to progress today.

It was my great pleasure to once again be a part of the HxGN LIVE conference in Las Vegas in June. Amongst the great sessions, keynotes and demonstrations, I was delighted to be able to speak to so many Hexagon Metrology customers, partners and staff, and I was particularly struck by the number of people who told me amazing stories of innovation. In just 12 months since our previous conference, the developments in our product portfolio, progress in the way we work and the changes in the needs and demands of our customers have been immense. And the common theme behind these changes? Everyone wants to work smarter.

This issue of MEASURE UP looks at the Fourth Industrial Revolution. We know that a new age of industry is just around the corner and are already innovating to meet the challenges ahead. At Hexagon Metrology, we are making the transition to smart manufacturing – and we want to be your metrology partner as you adopt this new approach. By exploring some of the key trends for industry in the connected world – integrated systems, smart enterprises, automation, user experience, customisation and glocalisation – we will give you just a small glimpse of the future.

Happy reading

Norbert Hanke
President and CEO
Hexagon Metrology

Follow me on Twitter @NorbertHanke
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Go to www.hexagonmetrology.com/measureup for past issues
New laser scanner for the latest ROMER Absolute Arm

Hexagon Metrology has launched the Hexagon Probe Laser 20.8 (HP-L-20.8) external laser scanner for the ROMER Absolute Arm – the much anticipated replacement for the hugely successful CMS108.

The first ROMER Absolute Arm scanner certified to the new ISO 10360-8 standard, the HP-L-20.8 offers improved measurement even on challenging surfaces and shiny materials. The unique adjustable scanning width, with a line length of up to 230 mm and scan rate up to 150,000 points per second gives incomparable performance for high-speed 3D point cloud capturing.

Fully integrated with the ROMER Absolute Arm via feature pack, the HP-L-20.8 requires no additional cables or controllers. Users can switch between scanning and probing at the touch of a button, and the repeatable mounting minimises setup time. "With the new external laser scanner HP-L-20.8, Hexagon Metrology provides its customers with the most portable and productive scanning solution for a wide range of applications. Thanks to the quick and easy handling, the widest line length and highest scan rate in its product class, the HP-L-20.8 gives its users increased productivity with shorter measuring times," said Stephan Amann, Product Line Manager for Portable Measuring Arms at Hexagon Metrology.

Vero Software acquisition announced by Hexagon

Hexagon has significantly strengthened its software portfolio through the acquisition of Vero Software, a UK-based company with a strong brand and customer satisfaction record. Vero Software is a world leader in Computer Aided Manufacturing (CAM) software. Its products aid the design and manufacturing process with solutions for programming and controlling machine tools, addressing the challenge of achieving manufacturing efficiencies with high-quality output. The acquisition gives Hexagon the means to extend its newly-developed MMS (metrology planning software) to include CAM (manufacturing planning software).

Vero Software’s well-known brands include Alphacam, Cabinet Vision, Edgecam, Radan, SURFCAM, VISI and WorkNC. The company has large market coverage with offices in the UK, Germany, Italy, France, Japan, USA, Brazil, Netherlands, China, Korea, Spain and India supplying products to over 45 countries through its wholly-owned subsidiaries and reseller network. “Together with its unique suite of
manufacturing software solutions, Vero Software has the expertise, knowledge and resources to deliver even higher levels of productivity to our customers,” said Hexagon President and CEO Ola Rollén. “Leveraging our global footprint, the synergies from our combined technologies will advance our strategy, supporting the growing need to integrate all data and processes across the manufacturing lifecycle.”

BLOODHOUND Project update: 1000mph office takes shape

Engineers from Hexagon Metrology were on hand to assist as the BLOODHOUND Project team fitted the seat for driver Andy Green’s rather unusual office.

When you are planning to take a supersonic car to 1000mph and break the land speed record, the seat might seem the least of your concerns. But with safety crucial, this unconventional twist on a workstation assessment saw Andy sitting perfectly still on a polystyrene and epoxy resin ‘bead bag’ in the BLOODHOUND SSC cockpit to create a mould of his driving position.

Hexagon Metrology was there to help the BLOODHOUND Project engineers update their CAD model with details of Andy’s seat and sitting position. When the seat mould had set solid, the team used the integrated laser scanner of a ROMER Absolute Arm to scan Andy in place within the monocoque.

Once this data was gathered, Andy could leave the car and the Hexagon Metrology engineers got to work, scanning the seat form to record every detail. Information from the fitting will be used to create a carbon fibre seat shell and mount it solidly into the cockpit structure, ensuring that Andy’s 1000mph office is ready for launch.

TESA inductive wireless probes showcase innovation

TESA has unveiled a new range of inductive wireless probes, representing a major technological leap in the field. Following three years of research and development, they offer unprecedented robustness and stability during data transfer and ensure fast, reliable measurements in both static and dynamic modes, even when the instrument is moving or under acceleration.

Unique technical features include the proprietary TESA Wireless Interface (TWIN) protocol and synchronised bi-directional communication, while the absence of connecting cable gives the probe complete freedom of movement during measurement.

Marcel Bila, TESA Group Marketing Director, notes: “Our position as a world leader in micro-metrology has again been confirmed by this unprecedented innovation. We are convinced that the productivity gains made possible by these new probes, along with their versatility, will make these instruments indispensable tools for many cutting-edge manufacturers”.

All BLOODHOUND Project images: credit Stefan Marjoram
INdustrial revelations

As manufacturing stands on the brink of a new age of connectivity and data-driven production, MEASUREUP enters the Fourth Industrial Revolution and explores why Hexagon Metrology is already where you need to be.

Fourth Industrial Revolution Glossary

**Smart Object**
A uniquely identifiable computer-like object with data storage capacity.

**Internet of Things (IoT)**
An interconnected network of smart objects capable of facilitating data transfer and automation.

**Machine to Machine (M2M)**
A communication method enabling objects or devices to communicate with similar devices to themselves via physical or wireless channels.

**Smart Enterprise**
A data-driven company that utilises information to improve processes, sometimes referred to as the theoretical result of combining IoT and M2M principles.

**Cyber-physical Systems**
A system of collaborating computers or computational elements which interact to control physical processes such as robotic assembly.

**Industry 4.0**
A project within the German government’s technology strategy that aims to computerise industry to create the factories of the future.

**First Industrial Revolution**

1784

Mechanical Production
Water and steam power developments help to facilitate mechanical production

**Second Industrial Revolution**

1870

Mass Production
Electrical energy and concept of labour specialisation enable mass production
In the space of a little over 200 years, industrial development has seen the world change completely. From early experiments with mechanisation in the eighteenth century through to mass production techniques and more recently digitisation and mass automation, there are certain points in history where a series of unrelated developments begin to come together and the result has a profound impact on the way that ordinary, everyday people live their lives. Often, we call these times revolutions.

There is no denying that there has been a seismic shift in technology capabilities over the past decade. Electronic devices, mobile devices, storage capabilities, data transfer capabilities – the likes of which were unheard of ten years ago – are now commercially available and in demand on the mass market. We’re moving at such a rate that televisions and smartphones and cars and computers can become dated or even obsolete within months of rolling off the production line. When progress shows no sign of abating, we reach a real tipping point. But what actually characterises this Fourth Industrial Revolution?

The major differences between the digital revolution of the late 1960s and the developments we are seeing today are data and communication. Not only is there a greater ability to gather data now, but we are also far more adept at storing and transmitting data than ever before. The ability to process data means businesses are beginning to transition from simple reporting to more complex analytics which create useful information.

Data is great, but information is better. When we have information, we can act upon it. In an industrial environment, information enables decision-making to become far more agile and responsive, perhaps to improve asset management, logistics or supply chain interaction. Quality control and traceability are also driven by data, but it is the information output that enables us to make corrections.

Hexagon Metrology supports its customers by gathering data and turning it into actionable information. Our research and development continues to focus on new ways to improve this service – using new hardware, new software, new ways of transferring and packaging data. We are ready for the Fourth Industrial Revolution, because it is an extension of the data-driven world that we have inhabited for many years already.
Like most aspects of the manufacturing process, metrology relies on you having the right tools for the job. There are many ways that you can measure a single object, each with their pros and cons. But sometimes, even having the best equipment doesn’t guarantee success – a problem that Hexagon Metrology tackled when designing the HP-O optical probe.

Unlike many camera-based non-contact probing methods, HP-O is an active optical measuring solution. Using an interferometric laser system to record a thousand points every second, it offers comparable accuracy and reliability to tactile probing, with the added benefits of increased speed, greater measurement distance and far better accessibility for hard-to-measure objects.

For applications where non-contact probing is advantageous, optical sensors provide a compelling solution, but they are not without their problems, as Ingo Lindner, Hexagon Metrology’s Stationary CMM Product Line Manager, explained: “Many people want to measure optically to avoid some of the limitations of tactile probing such as scratching sensitive surfaces. However, optical sensors are often difficult to integrate into the standardised workflow of coordinate measuring machines (CMMs), so they tend to be used only in special circumstances.”

In developing HP-O, Hexagon Metrology wanted to change this attitude. Instead of taking the probe as an individual component, the engineers looked at the system as a whole, combining the machine, the sensor and the software as an integrated package – each optimised to work with the others.

Lindner continues: “With the HP-O solution, which was developed specifically for Hexagon Metrology CMMs, we believe we have found the way to establish optical scanning with a speed that outperforms other systems.”

HP-O is available as part of a complete solution, which also includes the Leitz PMM-C high-accuracy CMM and the specialist QUINDOS operating software, ensuring that the sensor is fully integrated and optimised for the work at hand. The laser source sits outside the machine in a controller, and is transferred via fibre into the optical probe head, which then emits the light towards the part. In combination, the machine, sensor and software form a high-speed, high-accuracy 4-axis system, with the 3-axis CMM plus rotary table offering a solution which is perfect for measuring cylindrical items, blades or other delicate objects.

Not only does the integrated design of the HP-O solution optimise performance overall, but it also minimises the installation and setup time. Customers benefit from immediate gains in productivity and soon start to see returns on their investment. And although the system is optimised for use with HP-O, it is not limited to this measurement method, with multiple optical heads or tactile probes interchangeable within a program using an automatic tool changer – ensuring that whatever the right tool for the job is, your machine and software are ready to use it.

Following the successful integration of HP-O with Leitz PMM-C, Hexagon Metrology is developing further integrated systems using the same principles to offer HP-O optimised solutions for a wider range of CMM platforms.
“The HP-O is not just a camera. A camera is a passive system, whereas the HP-O is an active optical solution. The system is interferometric, meaning it is the most precise technology for distance measurement on the market, and the high accuracy makes several applications possible.”

Christian Schorr
Business Development Non-contact Probes, Hexagon Metrology

“There are different optical sensors for CMMs. Some are fast, some give accessibility, others are flexible. Here we combine all these benefits in one sensor, so we have high speed, good accessibility and great accuracy. Anybody looking for higher throughput has to be interested in this technology.”

Micha Neininger
Product Manager, Hexagon Metrology

“These systems are normally 1D probes. With the HP-O we have a complete 3D system for measuring.”

Glen Wiltshire
Product Manager, Hexagon Metrology

HP-O in numbers
- 1kHz measurement frequency
- 1000 points per second
- Up to 20mm measurement range
- 11µm short-range spot size
- 190g probe head weight
- 3mm probe diameter
- ±30° rough surface acceptance angle
- ±4° mirror surface acceptance angle
For many businesses, big data is a big problem. Storage, cataloguing, security – and all of this before you’ve even obtained any useful information from it. But at Hexagon Metrology, we’re used to data. In fact, it’s what we do.

Metrology equipment is all about data capture, and in our software we provide solutions which turn the raw data gathered into actionable information – something with real, tangible meaning that can be used to inform business decisions – and help enterprises to get smarter.

As industry moves towards the Internet of Things and Machine to Machine communication enables increased data flow, many manufacturers have already begun to invest in product lifecycle management (PLM) solutions as part of their transition to a smarter way of working. In designing the Metrology Management System (MMS) platform, developers from Hexagon Metrology took their inspiration from PLM systems to create a metrology counterpart, with the ability to complement and work alongside existing PLM solutions and enhance their capabilities by managing, packaging and allowing you to use data more effectively.

Meeting quality management demands
Developed on the principle of combining proven solutions to solve customer problems, MMS represents a convergence of technical thinking and functionality from several different Hexagon Metrology software packages. With a modular architecture based on Intergraph SmartPlant® and featuring bi-directional information exchange with PC-DMIS, it is the first system to extend PLM theory into the metrology world. The result is a central system capable of managing every aspect of quality control from product conception and design through to service, whatever industry you are in.

MMS allows Hexagon Metrology to answer three key customer demands:

- A complete metrology solution to replace piecemeal individual tools
- A scalable option to manage quality departments ranging from a single

New technology enables you to measure every component in greater detail, in a fraction of the time, generating more data than ever before. Now what are you going to do with it? MEASUREUP investigates how big data becomes actionable information through Hexagon Metrology’s state-of-the-art Metrology Management System.
• A quality function which is tightly integrated with design and manufacturing

The benefits of MMS can be felt across the business. Through MMS Dashboard, managers have access to an advanced information display, giving an at-a-glance overview of key operational indicators like machine asset status and utilisation. Quality supervisors can use the same module to manage facilities, machines, part routines and even user account access to minimise risk. Accessible from multiple devices, including tablets and smartphones, MMS Dashboard leaves nothing to chance, ensuring constant quality control and offering real peace of mind.

At a shop floor level, MMS Inspect offers operational staff a single platform to run PC-DMIS. With MMS, all operators have easy access to the most up-to-date part routines as well as historical inspection reports, creating a single version of the truth to prevent errors or confusion. Suppliers can gain similar benefits, as well as being able to send data directly to the manufacturer’s database to maximise supply efficiency. And with real-time reporting at all levels of the business, MMS keeps the whole organisation ahead of the game.

Improveing the supply chain
A prime example of where MMS has the potential to add value is in dispersed supply chains. Most large-scale engineering projects draw on the expertise and resources of several factories in different locations, or even several different companies, to supply the parts they need. In the aviation industry for instance, components may be produced thousands of miles apart so metrology data is vital for ensuring assembly runs smoothly. With MMS, not only can data be gathered from each of the individual factory locations, but it can also be processed and used to run virtual assembly modules, ensuring that costly real-world assembly problems can be prevented before they begin.

Similarly, change management and asset management modules offer greater agility within the supply chain, allowing companies to proactively respond to changing designs and rapid product development such as in the world of consumer electronics.

Future-proofing for metrology
The smart enterprise movement remains in its infancy and while not every business is ready for such a paradigm shift as yet, manufacturing is starting to move away from the traditional linear production model. With greater flexibility within the factory, businesses will be able to produce more products, more quickly – providing that they have the systems and software in place to manage the process. As the flow of information and objects converge, there is huge potential for metrology to interact with process operations. Smart objects which carry their own measurement data would offer unprecedented traceability, while implementing active feedback loops could minimise wastage and ensure the desired levels of production quality are there at output. With MMS you can have the future, today.
With data-driven automatic operations playing an increasingly significant role across the industrial spectrum, Hexagon Metrology’s development focus is on making automation more intelligent, generating data and using it to directly influence production line actions for greater agility and even real-time responses. Welcome to metrology that is definitely more than meets the eye.

Automation comes in many forms. Once the stuff of science fiction, robots are now familiar sights in thousands of workplaces, while automated programs run all kinds of software and systems around our homes and in the wider world. For Hexagon Metrology, automation applies to several areas spanning both hardware and software. Physical automation such as pallet systems, robotic part-loading and probe tool changers have enabled us to increase speed, efficiency and throughput in the measuring room. Reliable robotic inspection systems are increasingly common, while the potential of metrology solutions to improve the accuracy and capability of assembly line robots is growing rapidly. The latest metrology software packages even enable users to automate parts of their programming tasks. Between Hexagon Metrology’s automation experts and our extensive network of trusted integration partners, we have designed and implemented a huge number of unique and revolutionary systems for customers around the globe.

Among these automated solutions experts is Raimund Loser, who joined Leica Geosystems over 30 years ago. Following an apprenticeship in fine mechanics, he studied Geodesy at the Technical University of Munich and is now responsible for developing special systems within the laser tracker product line at Hexagon Metrology. MEASURE UP spoke to Raimund about the present and future of metrology automation.

MEASURE UP Tell us a little about your background and experience…
My start as engineer was in the research and development department. From 1991 until 2003, I was R&D Manager and worked on the development of absolute distance meters (ADMs) and six degrees of freedom (6DoF) scanning. Meanwhile I gained a PhD in Technical Science from the Federal Institute of Technology in Zürich.

MEASURE UP And you are part of the laser tracker team?
That’s right, for seven years I’ve been responsible for Special Products and Projects. During this time I’ve done a
lot of research and tried to find new applications for our technology. Based on that experience, all our laser-tracker operated automated solutions were developed.

MU From a metrology viewpoint, what does the term ‘automation’ mean to you?
Automation has become a keyword in industry during the last few years. From a metrology point of view I see two different capabilities. The first is to automate the measurement aspect within production – automated inspection either by tactile measurement of single points, or by directly scanning point clouds to analyse scan data or extract features to compare with the CAD data. The second capability is to use measurement data actively to enable automated processes like guiding large machines or robots to the right position before drilling or riveting.

MU What are some of the current applications of automated solutions?
Several applications are possible, like our automated part control for assembling aircraft fuselage components or the in-line feature control measurement solutions we provide for several major car manufacturers. In terms of robot guidance, we have implemented an intelligent stringer placement system for aviation builds, and we even have an automated milling process for producing car fixing tools.

MU What is the key research and development area for automation in metrology at the moment?
Metrology automation is really just beginning, but Hexagon Metrology research has already led to a lot of improvements. In future, we will have smaller, faster and less expensive sensors. Then there is all the development work in relation to flexibility – up to the real-time control of robots or machines during the movement process. In general, timing and flexibility are the keywords here and these will finally become the success factors.

MU Where do you see the factories of the future going in terms of automation?
There are many different influencing factors and production of a number of products is already highly automated – mobile phones are one example. For larger parts and objects, automation will still increase a lot. Automated detection of parts and features will become more important to increase flexibility, even during the assembly processes. I’m sure that with each new process, new ideas will be created to make life easier. Soon the combination of human workers with ‘sensitive robots’ for interactive processes will become reality too.
AUTOMATED SOLUTIONS AT A GLANCE

1 Leica T-Mac
The Leica T-Mac is a tracker machine control sensor designed specifically for automated solutions using the Leica Absolute Tracker. With three models and accessories available to adapt for almost any system, it enables both laser guided probing and measurement applications, and complex machine control options.

2 Leica T-Scan
Mounted to a robot and working with the Leica Absolute Tracker, this high-speed laser scanner offers a quick, efficient and reliable automated inspection solution. With no powdering required and self-adjusting systems giving the best readings possible in a single pass, even on shiny metallic or dark surfaces, Leica T-Scan units are optimised for automated scanning.
360° SIMS
Hexagon Metrology 360° Smart Inline Measurement Solutions (SIMS) provides a broad solution for fully-automated dimensional process and quality control. Based on extensive development and implementation experience, the 360° SIMS offering includes a variety of cell configurations for robotic 3D metrology and process control for automotive plants.

WLS400A
The Hexagon Metrology WLS400A white light measuring system is a flexible solution for real-time shop-floor metrology. Applicable with all common industrial robots, this turnkey solution overcomes demanding environmental conditions such as vibrations, temperature and light level changes to acquire dimensional information from objects, regardless of size, complexity or geometric features.
From the most complex of software to the simplest switch, the way we interact with technology shapes both our perception of its quality and the results we achieve by using it. In this Shaping Change Blog post, Milan Kocic, Hexagon Metrology’s Product Manager for Software, Sensors and User Experience, explained why UX is so important to Hexagon Metrology and looked forward to some new developments. MEASUREUP examines our progress.

“For about 18 months, several divisions in Hexagon Metrology have been working on user experience (UX) and customer experience (CX) projects.”

“Thinking about the user experience before the users get to experience it – that’s shaping smart change.”
To start, let’s dig a little deeper into what UX actually is. UX is defined as the overall effect created by the interactions and perceptions our customers have when using our products or services.

Users of our products and services will always have an experience whether we design for it or not. First impressions can determine if our product is a success or a failure. We cannot leave good user experience to chance; we need to take control of our users’ outcomes with all our products. A bad user experience will cost us sales, retention, productivity, market share, brand value and more. Good UX is about creating products that are useful, usable and desirable. It’s a key technology enabler and market differentiator. In the sea of sameness we have in a mature industry like ours, concentration on good UX is essential.

In our own lives, we can remember plenty of experiences where a good one stayed with us forever and bad ones were quickly forgotten. There is a saying in the US – “You only get one chance to make a first impression.”

There is a general shift in our society regarding the expectations of technology and how the UX integrates with our lives:

- Today, more people have mobile phones than have electricity or safe drinking water (Source: State of the Global Mobile Industry, Annual Assessment 2012)
- People are more technologically aware
- Users expect intelligent systems that anticipate their actions
- Users expect immediate gratification from the user experience
- Users expect devices that talk to each other; up-and-coming users no longer use traditional interaction devices – an estimated 72% of primary devices bought by 2017 will be tablets and smartphones (Source: Gartner, Inc.)

Hexagon Metrology has spent the last 18 months working on quite a few user experience items to be introduced, mostly in our bridge product line. We have tried to take a peek at the future and bring some of it to our CMMs. Some of these are very simple improvements and some will require a little more R&D and implementation.

One product that has benefited from our new UX product development approach is PC-DMIS Touch, where we took the power of a well-established, desktop-based software and provided a revolutionary new way to interact with inspection data and measurement devices.

Some of you have seen examples of these items in prototype form over the last year. As I mentioned above, these items do not necessarily enhance the speed or accuracy of our machines, but concentrate on the efforts customers have to make when preparing a part for measurement and to process after completion of the measurement routine.
USER EXPERIENCE IN PRACTICE

1 **Illuminating lighting**
   Built-in illumination for the workspace areas of each CMM ensures constant light levels and operator comfort.

2 **Message lighting**
   Signal lighting indicates machine status for the convenience of operators working away from the machine or at a separate workstation.

3 **Jog box redesign**
   Ergonomically designed next generation jog box offers greater durability and a more user-friendly interface with the machines.
4 USB ports
The addition of USB ports alongside the built-in monitors allows easier backup and transfer of data between systems.

5 Power switches
Relocation of power switches from the back of the machine to the front brings controls closer to the user to speed up access.

6 PC-DMIS Touch
Intuitively designed user interface for PC-DMIS software makes even complex measurement tasks seem simple.

7 Measurement volume indicators
Etched measurement volume indicators help operators to immediately place the part on the machine correctly and so ensure maximum throughput.

8 HUB display
A central source drawing data from several sensors enables users to monitor environmental changes from a single display or relay the information to smart portable devices.

9 Google Glass
The touch interface and voice command systems of Google Glass offer an alternative way to control software for portable metrology devices, leaving users’ hands free to measure.
Everyone loves custom. Despite the cost, consumers are willing to pay a premium to get their hands on an item they can truly call unique. As the Fourth Industrial Revolution promises to make the dream of ‘mass customisation’ a reality, Hexagon Metrology’s own brand of custom metrology solutions are already making a difference in industry.
Mass customisation is a major buzzword for manufacturing at the moment. Combining the quality and flexibility of customised products with the low unit cost of mass production techniques is something of a holy grail – the ability to manufacture to a customer’s needs without losing the economic efficiency of mass production.

To be successful, mass customisation relies on delaying the differentiation of the product from the batch to the last possible moment. With IP enabled smart objects carrying their own specification data, this idea could become a reality. But to work, it requires synergy between systems, with hardware, software and processes perfectly aligned to enable this level of control. This is where Hexagon Metrology’s custom solutions are supporting smart manufacturing development.

With custom solutions, Hexagon Metrology takes standard products and makes improvements to the customer’s requirements. Years of experience and a huge product portfolio have made our teams adept at combining products into solutions that are greater than the sum of their parts, and we are uniquely placed to solve problems in new and different ways. Hexagon Metrology’s four approaches to custom solutions are designed to add value for each and every customer.

1. Standard product with application expertise
   Application expertise such as specialist programming or a measurement plan simplifies the installation and setup of products, cutting the time to use.

2. Standard product with specific accessory package
   By adding application-specific hardware such as fixtures or part-handling systems, accessory packages result in a turnkey solution optimised for the customer’s process.

3. Multiple technologies combined for a specific purpose
   Using several technologies from Hexagon Metrology, other divisions of Hexagon and third-party suppliers, this approach creates an advanced application solution to maximise productivity.

4. Fully integrated solutions
   Incorporating metrology equipment at various points of production and turning the data gathered into actionable information that informs decisions, using Metrology Management System (MMS).
Customisation in practice
Hexagon Metrology Vision

Hexagon Metrology Vision produces the highly versatile Optiv multisensor coordinate measuring machines. As well as tactile probes, Optiv CMMs can be supplied with an impressive array of non-contact metrology tools, including an image-processing vision sensor, a chromatic white light sensor and a through-the-lens laser system. In effect, every machine is customised for use, with Vision experts able to offer advice on the best combination of sensors for each application and support the customer through setup and programming.

In the case of Hitega Präzisionsmechanik, customisation went even further. The addition of automated pallet systems, an offline programming station and specialist software to meet the rigorous regulatory requirements of the medical supply industry, offers an example of Hexagon Metrology’s willingness to adapt solutions for the customer’s environment and process.
Case Study
Hitega Präzisionsmechanik

Precise, compact and somewhat special. The perfect description of a Hitega product. The company from Gangkofen in Lower Bavaria has established itself as a precision engineering service provider.

Various optical, tactile and multisensor measuring systems are essential to the success of the Hitega team. Its customers in the healthcare and biomedical engineering sectors require 100% inspections and watertight documentation at every single stage of the process.

Flexible multisensor technology
Three multisensor systems supplied by Hexagon Metrology are used for quality assurance at Hitega. Armed only with callipers and a micrometer, Hitega would not have progressed very far. The parts are too complex and the requirements of the customers too high. Martin Ebner, production manager at Hitega, explains: “Everything has become increasingly complex over recent years. We receive parts, for example spinal implants, which have form and position tolerances here, there and everywhere, all of which have to be checked.”

Tolerances on the various features are usually of the order of hundredths of a millimetre and in most cases are checked against the CAD model. Hitega employs optical and tactile measurement procedures in order to capture all the features. By using multisensor measuring systems from Hexagon Metrology, Hitega can do all this in one clamping operation. All three machines are fitted with high-precision optical and tactile probe systems as well as laser sensors.

Traceability from A to Z
However, multisensor machines on their own are not enough. Just as important is complete documentation. For some of Hitega’s customers, the US Food and Drug Administration (FDA) regulations come into play. The FDA’s CFR 21 Part 11 covers electronic records and signatures and is mandatory for manufacturers of biomedical engineering products. “Our Optiv Performance 442 supplied by Hexagon Metrology is equipped with a suitable validation program. It allows us to maintain the passwords of each user in a protected database, record user access to the system and assign everyone an electronic signature,” explains Ebner.

Almost like measuring it yourself
In the case of small batches with high metrology content, the company opts for inspection by the production staff. Ebner set up the measuring program to cope with this: “I have designed the user management system to allow certain operatives limited user rights for certain parts. The operative enters his name, password and the ID number of the part. The monitor then displays an image showing the operative exactly how to clamp the part. With just a few mouse clicks, he can start the measuring program, which then runs fully automatically.”

For larger batches, Hitega switches to pallet measurement. Spinal implants manufactured from PEEK (polyetheretherketone) are some of the products inspected like this. The multisensor system completes a 100% inspection of 30 to 40 implants overnight – without user intervention.

Capacity bonus thanks to offline programming
Sometimes there is hardly any machine time left for measurement programming. A good reason for Hitega to invest in an offline programming station. About 70% of the programming is purely data input, for example loop programming or parameter assignment. The offline station has proved ideal for this sort of task. “Previously we had only one Hexagon Metrology measuring machine with multisensor capability. Now of course, we have a much better arrangement,” says Martin Ebner. “The software itself is superb and the support from Hexagon Metrology is top class. Over all this time we have found Hexagon Metrology willing to listen and quick to come up with a solution.”

Download the Case Study
http://hex.ag/zJYs0
GLOCALISATION

St. Petersburg, Russia
Opening of the IMS Center

Premier Composite Technologies, UAE
Measuring a train cab using a Leica Absolute Tracker

A GLOBAL COMPANY ON YOUR DOORSTEP

Premier Composite Technologies, UAE
A ROMER Absolute Arm measuring a steel light shaft
‘Think global, act local’ is a growing maxim for business strategists keen to shake off accusations of consumer detachment. In an increasingly connected world, it’s even more important to be everywhere. MEASUREUP tracks Hexagon Metrology’s worldwide footprint and explores the advantages of being a global company with a local presence.

Everyone is familiar with the concept of globalisation. Enabled first by mass transport and more recently by digital communications, companies have been expanding into new markets and tapping global resources on an ever-increasing scale for so long now that we take it for granted. The world really feels like a smaller place. But avoiding that feeling of facelessness can be vital to success, particularly when taking an established product to emerging markets – and this is why glocalisation has become such an important term in business today.

Smart systems naturally lend themselves to global operations. The data-informed manufacturing techniques of the Fourth Industrial Revolution will help businesses move production closer to each specific target market while maintaining quality standards across the board. Mass customisation will allow them to tailor products for a particular region or country, producing smaller runs to reduce both shipping costs and wastage. But the truth is, there’s very little point investing time and effort in ultra-modern systems and manufacturing processes if there isn’t the infrastructure around it to support your operations and keep everything functioning as it should.

While Hexagon Metrology is committed to the continued development of products that will help customers to transition to smarter ways of working, it is also a business that understands glocalisation. It’s a part of our nature – we are global, and we are local.

Hexagon Metrology has more than 20 production facilities located around the world. From over 70 precision centres, we demonstrate products, service and upgrade equipment, and provide training and support to clients, while a network in excess of 100 distribution partners extends our reach across five continents. And this network is never stagnant – we are constantly reviewing the needs of our customer base and responding with new facilities like the recent service centre opened in St. Petersburg, Russia, in partnership with IMS Center. With demand also growing in the Asia Pacific region we have opened offices in Nagoya, Japan and Tambun, Indonesia, as well as a new technical facility in Gimhae, Korea. All are recruiting local talent and training engineers to offer a full range of services.

The reason is simple – we want to be where our customers need us.

Hexagon Metrology has the largest service team of any metrology manufacturer, Hexagon Metrology has both the expertise and the resources on hand for a quick and efficient response to your call, regardless of your location. Our local teams are committed to helping you ensure quality, minimise downtime and maximise efficiency through a complete range of aftermarket services:

- Systems consultation
- Skills training
- First part programming
- Contract inspection and programming
- Software maintenance agreements
- Certification and calibration
- System upgrades and rebuilds
- Service and repair

By focusing on the needs of customers, Hexagon Metrology has established itself as a global player with a local presence. Like the smart systems of the Fourth Industrial Revolution, we guarantee the same quality in any location and facilitate productivity by keeping your equipment operating at optimum performance. Like the connected communications of the Internet of Things, we use the knowledge we gain locally to inform our global research and development, sharing information to improve outcomes.
“One of the main benefits of working with Hexagon Metrology is their solution centres are located in close proximity to major manufacturing centres. As a leading OEM of metrology solutions, their equipment is on hand for immediate access and their people are trained on the equipment for application-specific tasks.”

Louis Ponce
President, Coast Aerospace Manufacturing, USA

“The Hexagon Metrology group easily proposed the best performing and most adaptable products, while at the same time offering a very professional consultancy, along with local, regional, national and international support.”

Christian Pascaud
Co-founder and Production Manager, Corima Technologies, France

“With the Hexagon Metrology systems, we’re thoroughly happy. The cooperation has been good from the beginning. We know that we can count on the arm and the trackers, as well as on the local service in Denmark.”

Ingo Boysen
Production Quality Manager, Vestas Nacelles, Denmark

“With Hexagon Metrology we can also count on good and fast technical support.”

Matthew Gorman
Quality Manager, Premier Composite Technologies, United Arab Emirates

“We got on well with the application engineers right from the start. Hexagon Metrology has its Dutch subsidiary in the area and this fact of course made many things much easier.”

Roland Sniekers
Managing Director, Euro-Techniek, Netherlands

“The experience of collaborating with an international group is genuinely positive. We were always able to rely on the local reactivity of the Lyon centre together with the Italian team on site.”

Dario Autorio
Physicist, Institute of Nuclear Physics of Lyon, France

“The hands-on training I had at Hexagon Metrology’s training centre was enhanced with a day onsite at our factory to further understand measurement techniques specific to our bike frames.”

Terry Blackman
Quality Control Engineer, Brompton Bicycle, United Kingdom

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Nagoya, Japan
Demonstrating white light scanning to customers at an open house event

Gimhae, Korea
The new Technical Support Centre which opened in 2014

www.hexagonmetrology.com | SEPTEMBER 2014 | MEASUREUP
2014 marks a very special anniversary for Hexagon Metrology’s flagship software product, PC-DMIS. In celebration of a quarter of a century leading the way in metrology programming solutions, MEASUREUP caught up with Ken Woodbine, President of Wilcox Associates, to get his thoughts about the past, present and future of metrology software.

MEASUREUP: PC-DMIS celebrates its 25th anniversary this year. What has changed in software and technology over that time then?

I think we take for granted a little bit what we have today for technology, but just think about where we were 25 years ago. For storage we used floppies, our current CPU would need a warehouse, and the worldwide web was only just invented. And programming coordinate measuring machines was a very slow process.

MEASUREUP: And how did PC-DMIS impact the software landscape?

Well PC-DMIS was the first product to use CAD in coordinate measuring machines, and this innovation led a trend that revolutionised the way CMMs are used. Today we talk about smart software, and in software ‘smart’ means solving customer problems through great leaps in innovation, like that first use of CAD. Since then we’ve continued to
push the envelope with innovation and PC-DMIS remains the world's number one CMM software.

**MU**: Anniversaries are normally a good time to look back and reflect on past achievements, but it’s also good to look forward and anticipate what is to come. Can you share some thoughts about Hexagon Metrology’s future direction for software?

Yes, today we’ve added to our portfolio a lot of excellent software products – as well as PC-DMIS we’ve got QUINDOS and SpatialAnalyzer, CoreView and Reshaper. Each is excellent in its own way. What we’re aiming at is to take the best technology from each and use it to create our next generation of software products. And in fact, this is what we’re working on now.

**MU**: How does this relate to current trends for smart software then?

Speed. Speed in creating a solution and in bringing it to our customers. These are the objectives of smart, and it’s achieved by what we call sharable tech, where we use the components from each to create solutions that are really more than the sum of the parts.

**MU**: And what does that mean in practice?

All our metrology softwares have common capabilities – they all work from CAD for example. They all do dimensioning. But there are also key differences though, that make each strong in its own way.

**MU**: Can you give a specific example of smart concepts in action from the Hexagon Metrology software portfolio?

It’s grown a lot since its introduction at the HxGN LIVE conference in 2013, and it combines the power of PC-DMIS with a metrology for the non-metrologist user experience. Our goal was to bring metrology to the shop floor. And by combining the core elements with the right user experience, we hit the jackpot!
DESTINATION 2015

Join Hexagon’s global network of brands for the biggest year in innovation yet. For the first time, HxGN LIVE will be brought to you from two locations – Las Vegas will host the conference in June, then November will see the premiere of HxGN LIVE Hong Kong. That’s double the opportunity to take part in inspiring keynotes, unlimited networking and must-see technologies!

Learn more at hxgnlive.com
Join us for more revelations… MEASUREUP offers you the chance to see the latest developments in metrology and quality control technology live in 2015 with free registration for the Metrology Track at the HxGN LIVE event of your choice.

Great stories await you in 2015! For the first time, Hexagon stages two HxGN LIVE events, offering a double dose of inspiring keynotes, unlimited networking and must-see technologies. For your chance to join us in Las Vegas or Hong Kong next year, simply visit www.hexagonmetrology.com/HxGNLIVE4FREE and register by answering the following question in less than 60 words: Over the last three years, what Hexagon Metrology product or service has been the biggest revelation for your business and why?

The winner will be selected by competition panel decision and will receive a conference registration worth $1,349 for one person, with flights and accommodation included*. The winner, along with the winning answer, will be revealed in the next issue of MEASUREUP.

*Participation in accordance with the General Terms and Conditions of Participation. Employees of Hexagon Group and competing companies, as well as persons under 18 years of age are not eligible to participate. Deadline for entries is 20 March 2015. For further details see the contest website.
Hexagon Metrology offers a comprehensive range of products and services for all industrial metrology applications in sectors such as automotive, aerospace, energy and medical. By empowering our customers to fully control their manufacturing processes, we enhance the quality of products and increase efficiency in manufacturing plants around the world.

For more information, visit www.hexagonmetrology.com.

Hexagon Metrology is part of Hexagon (Nordic exchange: HEXA B; www.hexagon.com). Hexagon is a leading global provider of design, measurement and visualisation technologies that enable customers to design, measure and position objects, and process and present data.

Along with more than 20 manufacturing facilities, Hexagon Metrology has over 70 direct precision centres, plus a network of over 100 agents and distributors across the world. Wherever you are, Hexagon Metrology is never far away.
Let's get social! To find out more about Hexagon Metrology on social media visit www.hexagonmetrology.com/social

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