

A *global* approach to quality

VERSION	MODELS	STROKES mm (in)		
		X	Y	Z
CLASSIC	5.07.05	500 (19.7)	700 (27.6)	500 (19.7)
	7.10.07	700 (27.6)	1000 (39.4)	660 (26.0)
	9.12.08	900 (35.4)	1200 (47.2)	800 (31.5)
	9.15.08	900 (35.4)	1500 (59.1)	800 (31.5)
	9.20.08	900 (35.4)	2000 (78.7)	800 (31.5)

VERSION	MODELS	STROKES mm (in)		
		X	Y	Z
PERFORMANCE	5.07.05	500 (19.7)	700 (27.6)	500 (19.7)
	7.10.07	700 (27.6)	1000 (39.4)	660 (26.0)
	9.12.08	900 (35.4)	1200 (47.2)	800 (31.5)
	9.15.08	900 (35.4)	1500 (59.1)	800 (31.5)
	9.20.08	900 (35.4)	2000 (78.7)	800 (31.5)
	12.15.10	1200 (47.2)	1500 (59.1)	1000 (39.4)
	12.22.10	1200 (47.2)	2200 (86.6)	1000 (39.4)
12.30.10	1200 (47.2)	3000 (118.1)	1000 (39.4)	

VERSION	MODELS	STROKES mm (in)		
		X	Y	Z
ADVANTAGE	5.07.05	500 (19.7)	700 (27.6)	500 (19.7)
	7.10.07	700 (27.6)	1000 (39.4)	660 (26.0)
	9.12.08	900 (35.4)	1200 (47.2)	800 (31.5)
	9.15.08	900 (35.4)	1500 (59.1)	800 (31.5)
	9.20.08	900 (35.4)	2000 (78.7)	800 (31.5)
	12.15.10	1200 (47.2)	1500 (59.1)	1000 (39.4)
	12.22.10	1200 (47.2)	2200 (86.6)	1000 (39.4)
	12.30.10	1200 (47.2)	3000 (118.1)	1000 (39.4)
	15.22.10	1500 (59.1)	2200 (86.6)	1000 (39.4)
	15.30.10	1500 (59.1)	3000 (118.1)	1000 (39.4)
	15.20.14*	1500 (59.1)	2000 (78.7)	1350 (53.1)
	15.26.14*	1500 (59.1)	2600 (102.4)	1350 (53.1)
	15.33.14*	1500 (59.1)	3300 (129.9)	1350 (53.1)
	20.33.15*	2000 (78.7)	3300 (129.9)	1500 (59.1)
	20.40.15*	2000 (78.7)	4000 (157.5)	1500 (59.1)

*DEA brand



brown & sharpe®

global



brown & sharpe.

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HEXAGON
METROLOGY

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global

...made to measure

Global coordinate measuring machines offer the most technologically advanced product line in 3D metrology available today. The Global platform is designed to deliver superior performance in all machine characteristics, including accuracy, speed, environment, reliability, and ease of use. Global products are also supported by Hexagon Metrology's global service and support network of metrology experts offering unmatched personalized assistance to our customers.

Global products provide accuracy, reliability, speed and affordability today, as well as future flexibility. Global has been designed to be adaptable to changes in technology, making it easy to integrate new sensors at a later time; helping your business stay competitive today and long into the future.

Producing the Global line of CMMs is a truly global undertaking for Hexagon Metrology™, the world's largest producer of coordinate measurement systems. Global machines are recognized around the world under the brand names Brown & Sharpe and DEA, and are locally produced and distributed through Hexagon factories around the world.

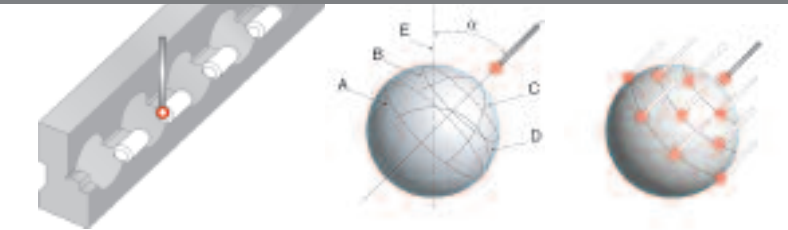


Functional capabilities for any requirement

Global offers various features that meet most any measurement application. Indexing probe heads offer easy access to common features and improve throughput by avoiding rack tool changes for different orientations. Alternatively, fixed probe heads can be utilized for accessibility into deep features that can not be reached with indexing probe heads. Various modes of data collection are available through advancements in the controller firmware and software tools, and include both known and unknown contact scanning, non-contact laser scanning, optical imaging, and point-to-point measurement. Each mode of measurement has its own advantages and can be matched to suit any application.

Full machine performance certification

The performance of all Global CMMs is checked and certified through the most rigorous application of test procedures specified by either B89 or ISO standards for CMMs.



Additionally, all aspects of our business, from product design and manufacturing to delivery and customer service have been reviewed and found to meet the internationally accepted quality standard ISO 9001:2000.

Top photo part courtesy of S&S Cycle, Inc.

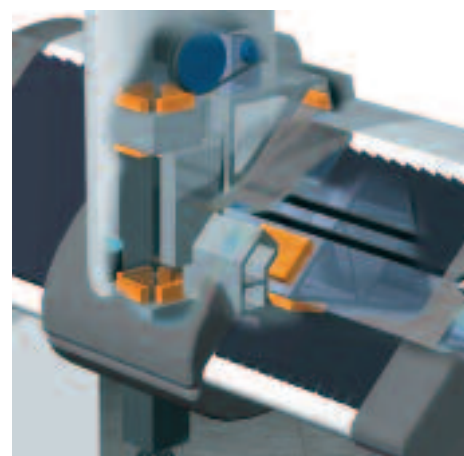
global

The evolution of technology

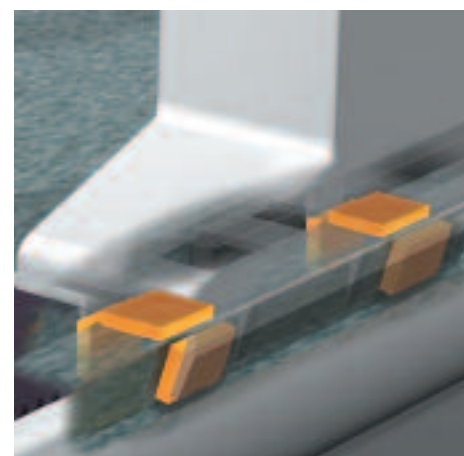
Global technology combines cutting-edge mechanical innovations, state-of-the-art motion controllers, advanced temperature compensation models, and PC-DMIS, the world's most advanced and most popular metrology software, to create the perfect solution for today's ever-changing manufacturing environment.

Precision in the details

- All-aluminum ultra-rigid frame, offering both a high strength-to-weight ratio and high thermal diffusivity to help eliminate temperature gradients which can greatly influence measuring uncertainty
- Exclusive triangular cross-section bridge beam design provides optimum moment of inertia for minimum deflection while operating at high accelerations
- High-rigidity aluminum alloy Z spindle provides enhanced performance while using vertically extended tooling.
- Heavy, stable granite table inherently resists vibrations.
- One-piece table construction with patented precision machined dovetail guideways improves accuracy and repeatability.
- Tuned elastomeric passive dampening system provides external vibration isolation.
- Remotely mounted drive motors reduce moving mass for faster bridge settling time, and help dissipate heat away from the machine frame.
- High resolution Aurodur® scales.
- Small footprint-to-measuring volume ratio makes it easy to fit in tight spaces.
- Easy access to working area from all sides.



Steel reinforced closed-loop belt drive is precision engineered with elliptical tooth profile to reduce machine vibration at high scanning speeds.



Wrap-around air bearings on precisely machined dovetail guideways provide optimum measuring repeatability and long term system stability. Easy-maintenance pre-loaded Belleville springs assure constant force over the machine's entire travel distance.

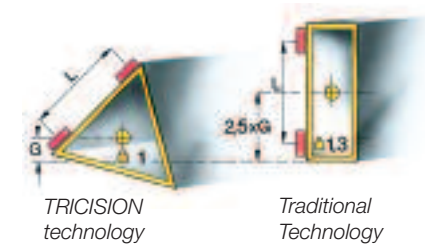


Advantage version shown with bellows covers

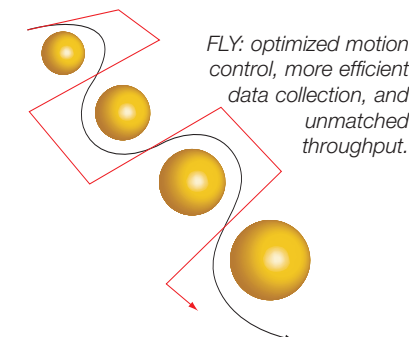
Precision in motion

Three dimensional motion interpolation (FLY) allows the machine to move along optimized paths between points, eliminating unnecessary stops and creating fluid machine motion. The result is:

- Up to 40% increased machine throughput
- Smooth, continuous path movements between points
- More efficient data collection
- When scanning a predefined path, the OBSERVER function inside the controller creates a feedback loop between the motion control algorithms and the probe head. This reduces measuring uncertainty and cycle time by keeping the head closer to the part's nominal dimensions.
- Exclusive 3D VECTOR FORCE OPTIMIZATION (3D-VFO) assures accurate probe compensation and improved data analysis in scanning applications. Collected data is compensated automatically in real time, for all force, drag, styli and weight change conditions. 3D-VFO means precise data, all the time, with any probe configuration.



GLOBAL's extruded triangular cross section bridge beam enhances dimensional stability for superior metrology performance.



FLY: optimized motion control, more efficient data collection, and unmatched throughput.

Environmental flexibility

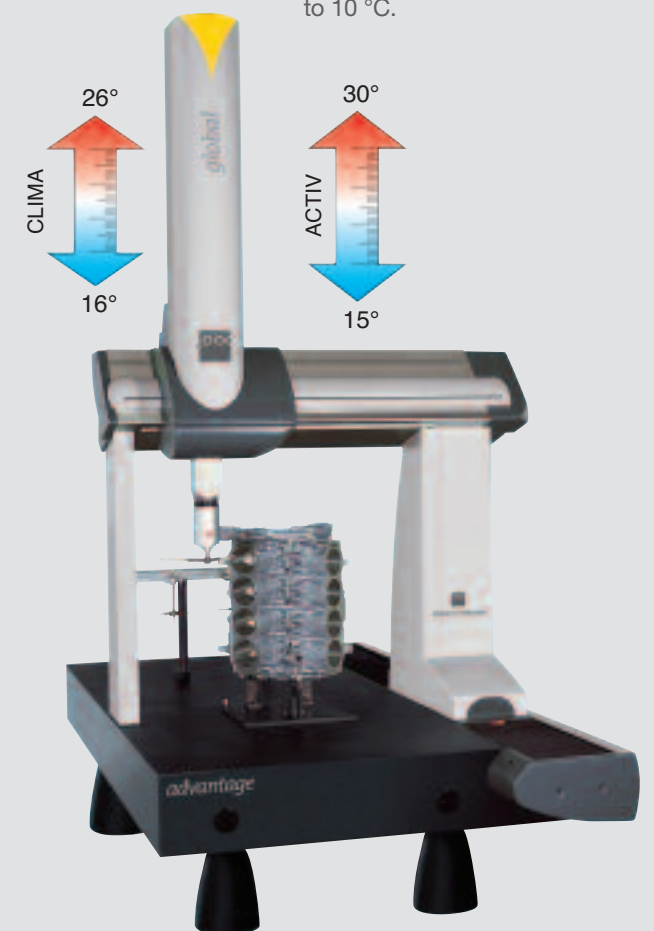
The Global line of CMMs brings superior measuring technology to a wide range of operating environments, from the lab to the shop-floor. The most critical environmental concern for metrology applications is temperature changes. When considering shop-floor deployment, special consideration must be given to temperature fluctuations, a major cause of measurement error. Global has options that solve this problem.

CLIMA: One solution for many climates

This innovative thermal compensation model offers high performance in the lab at 18–22 °C, as well as enhanced performance for standard room temperature at 16 – 26 °C. The CLIMA thermal compensation model uses a total of eleven (11) temperature sensors distributed throughout the machine to track temperature changes of the part and machine. Six (6) sensors are used to track the linear expansion of each axis, while four (4) sensors are used to track the temperatures of the granite to compensate for additional non-linear pitch deformations. One (1) sensor is used to track the part temperature. This sensor compensates for differences in expansion between the part and the machine. The allowable temperature-time gradient of the Clima option is 5 °C over a 24 hour period.

ACTIV: The solution for nearly any environment

The ACTIV® Technology (Adaptive Compensation of Temperature Induced Variations) takes environmental flexibility to the next level. The ACTIV® solution combines both an advanced parametric thermal compensation model with full protective bellows covers in X and Y axes for complete protection against broad temperature changes and airborne particulates that could adversely affect performance. The ACTIV® thermal compensation model adds additional temperature sensors on the X-axis as well as the granite in order to account for non-linear type errors caused by temperature changes. ACTIV is the ideal solution for dimensional inspection applications in a harsh shop-floor environment with temperatures ranging from 15 to 30 °C, and daily gradients up to 10 °C.



Packages to suit any need

The range of standard Global configurations has been enhanced to include three new attractively priced packages. The Classic, Performance, and Advantage versions of the Global offer three different levels of popular standard features to suit most every application. Additional options are also available to customize your Global to precisely your requirements.



Global Classic...
The industry's enduring classic

The most cost effective solution to common shop measurement and inspection applications. The Global Classic comes standard with a touch-trigger probe, software, training, and warranty.

Standard Package Summary:

- Probe:** TESASTAR-i, manual indexing probe head
- Software:** PC-DMIS PRO including standard measurement and GD&T capability
- Control:** Standard touch trigger controller
- Accessories:** Computer package, desk, installation, training, warranty
- Options:** Upgraded Probe, Upgraded Software, CLIMA temperature compensation



Global Performance...
When higher performance is demanded

The best solution for high tolerance parts and more sophisticated measurement tasks that require the assistance of CAD models. Global Performance comes standard with a touch-trigger probe, the CLIMA temperature compensation model, as well as advanced software with CAD capability, training, and warranty. The Performance model also has the added benefit of being a scanning-ready system without the need for additional wiring or controller electronics.

Standard Package Summary:

- Probe:** Motorized probe head and touch trigger probe
- Software:** PC-DMIS CAD including standard measurement, GD&T, and CAD capability.
- Control:** Standard, touch trigger capability with CLIMA temperature compensation
- Accessories:** Computer package, desk, installation, training, warranty.
- Scanning:** Available
- Other Options:** Upgraded Probe, Upgraded Software, temperature compensation



Global Advantage...
The advantage of accuracy and speed

The most advanced package available today that provides the combined performance of accuracy and speed. Global Advantage comes standard with a high performance touch probe, the CLIMA thermal compensation model, advanced software with CAD and additional capabilities, training and warranty. The Advantage model also includes the highest performance drives of all Global packages, bringing its top acceleration up to 4.3m/s², for maximum measuring throughput. The Global Advantage also has the benefit of being a scanning-ready system without the need for additional wiring or controller electronics.

Standard Package Summary:

- Probe:** Motorized probe head and touch trigger probe
- Software:** PC-DMIS CAD++, specialized measurement, GD&T, and CAD capability.
- Control:** Standard touch trigger capability with CLIMA temperature compensation
- Accessories:** Computer package, desk, installation, training, warranty.
- Scanning:** Available
- Options:** Upgraded Probe, ACTIV temperature compensation



Custom Sizes
for large work envelopes

Global machines can also be special ordered if an especially large work envelope is required. Larger sizes can be produced in the 15.YY.14 and 20.YY.15 size range where the Y-axis dimension can be either standard or custom length. These special systems can accommodate large and heavy parts without the need for special foundations, and can also be moved if needs change. These large Globals feature excellent volumetric accuracy and outstanding dynamic performance in spite of their size. Produced to order by Hexagon Metrology SpA in Europe, these Global machines are branded DEA and come with full installation, service and support by Brown & Sharpe.

Globals and Leitz™ scanning probes: the accuracy standard

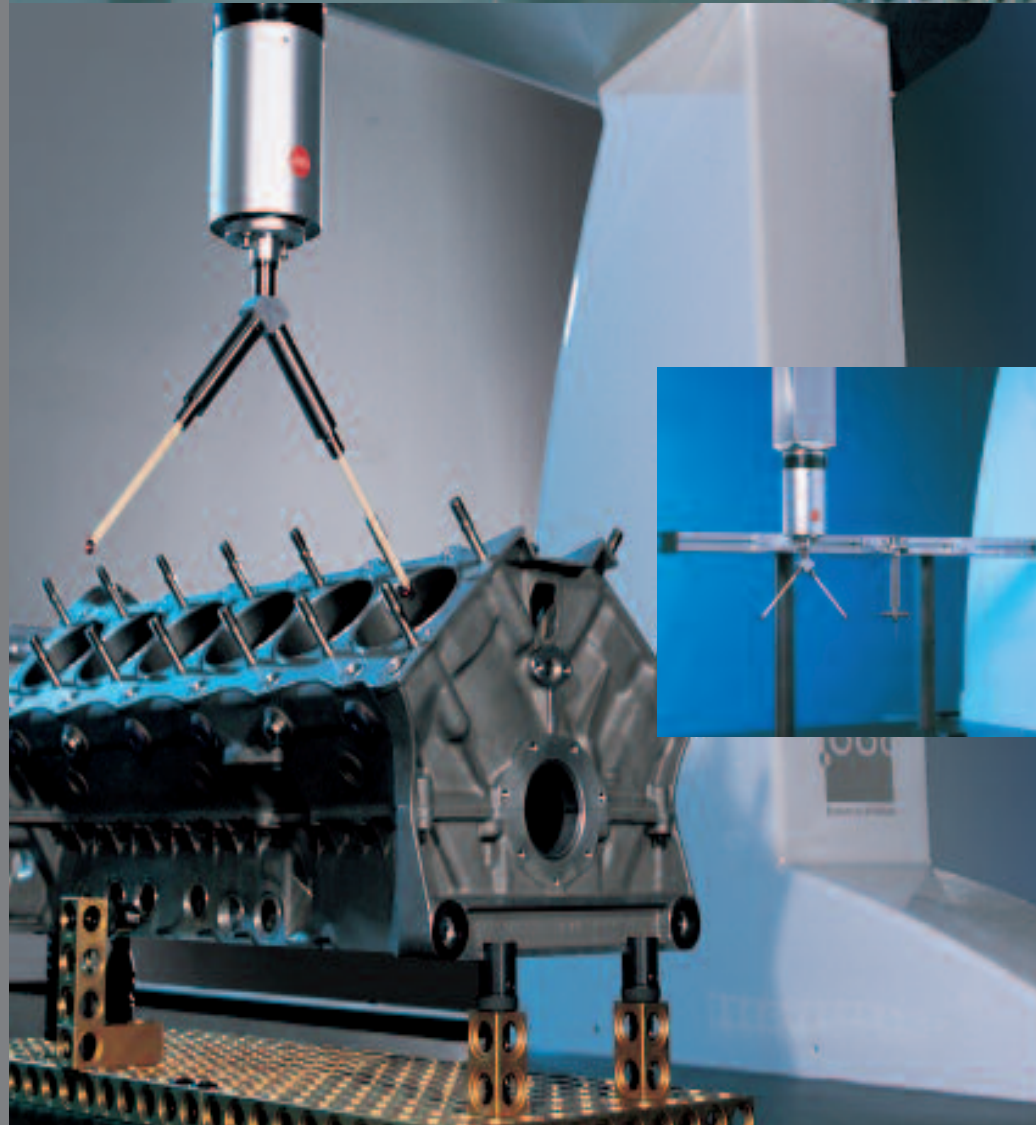
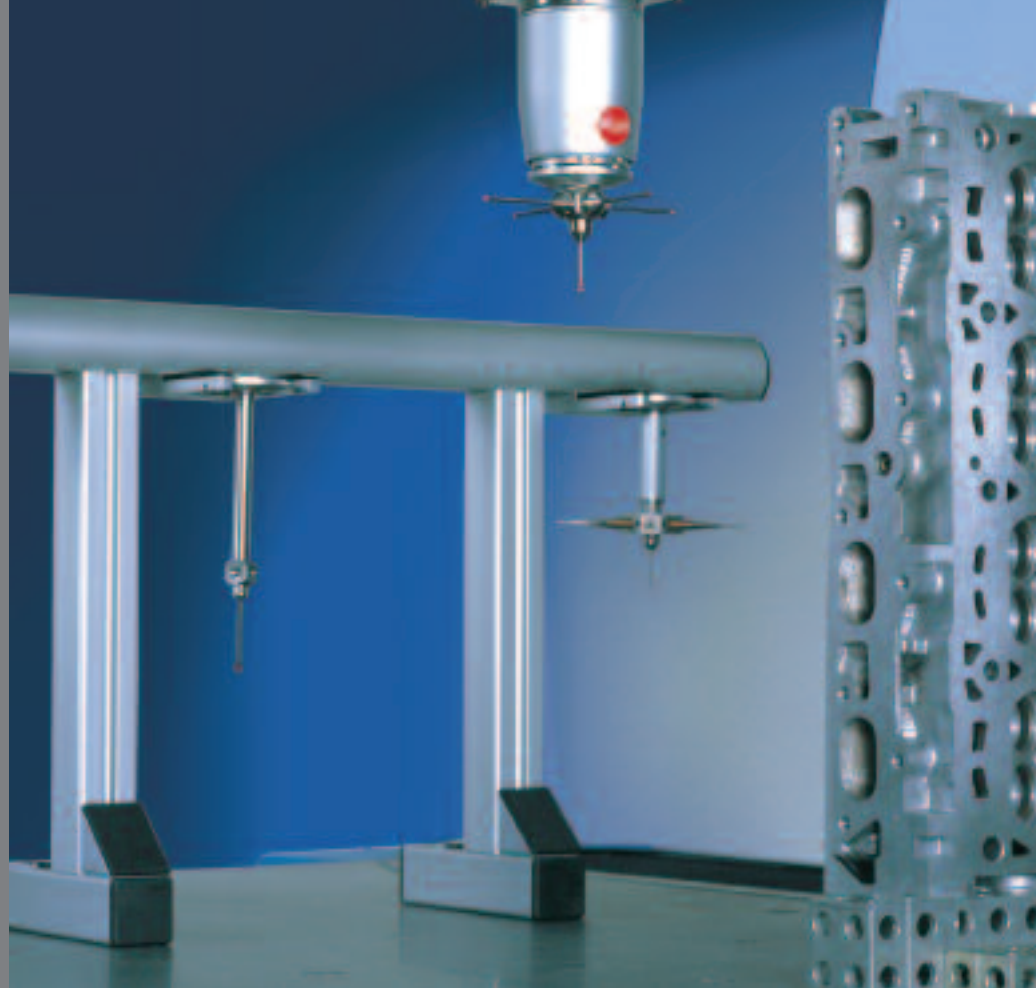
The new X-Series Leitz™ Scanning Probes (LSP), developed by Hexagon Metrology GmbH, have been specifically designed to meet today's requirements for high-precision and high-throughput coordinate measuring machines. Fast and accurate, even with very long extensions, these fixed scanning probes are the ideal tool to verify high-accuracy mechanical parts and complex geometries.

The X-Series Probes are full 3D analog probe systems. Probing deflections are measured via high resolution Linear Variable Differential Transducers (LVDT) and all data are evaluated perpendicular to part surface, eliminating cosine errors. This feature is vital when inspecting complex geometries such as gears, rotors, and turbine blades, since it ensures higher measuring accuracy and throughput.

The Leitz Scanning Probes support all the standard probing modes such as Single Point Probing, Self-Centering and Continuous High Speed Scanning for fast and accurate form and profile measurements.

LSP probes are available in two different versions: LSP-X5 and LSP-X3. The LSP-X5 can carry styli up to 500 mm of length and up to 500 g of weight and features an additional anti-collision system for extra protection of the head in the event of a crash. The LSP-X3 allows the use of probe extensions up to 360 mm of length and 150 g of weight.

Automatic tool changing with the Leitz Tool Rack allows styli changes within a measurement program without the need for re-calibration. Pneumatic clamping of the styli permits fast and accurate changing.



The Power of Technology

TESASTAR Probes

Hexagon Metrology now offers a complete range of Swiss-made probes which are designed for use on our coordinate measuring machines. TESA engineers have designed a complete group of components for coordinate measurement – including styli, extensions and accessories.

TESASTAR probe

The entry level product in the TESASTAR product family, this probe head is fitted with a touch probe with adjustable trigger force. The compact TESASTAR is especially convenient for small CMMs. It can be manually swiveled to an infinite number of positions.

TESASTAR-i indexing probe head

TESASTAR-i features repeatable indexing coupled with a high-precision integrated touch probe. The indexing capability in 15° increments in both axes allows the stylus to swivel through 168 positions without the need for recalibration. The A and B positions are clearly indicated in separate windows on the probe, so that the precise angle can be viewed at a glance. Indexing between positions is an easy, one-handed operation; tactile and visual feedback lets you know when the probe is ready to measure.

TESASTAR-m motorized probe head

TESASTAR-m is a motorized articulating probe head for CMMs that is capable of indexing in 5 degree increments, +180 degrees to -180 degrees in revolution, and +90 to -115 degrees in pitch. This translates to a total of 2,952 possible positions, including a unique “table-hugging” 90 degree horizontal position possible due to the indexing arm's asymmetrical shape. The head also features high speed indexing, with faster index changes than similar products.

The robust aluminum construction and rugged design permits extension rods with lengths up to 300 mm. The TESA kinematic joint connection on the TESASTAR-m accepts multi-wired probes, or, coupled with an M8 adaptor can be used with TESA touch trigger probes as well as other probe brands.

TESASTAR-p touch trigger probe

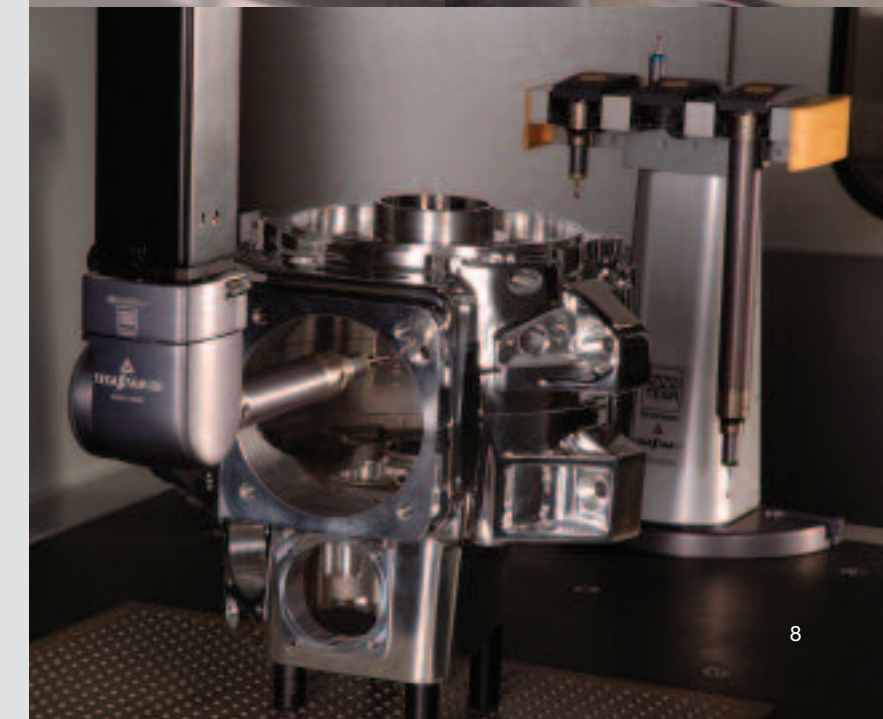
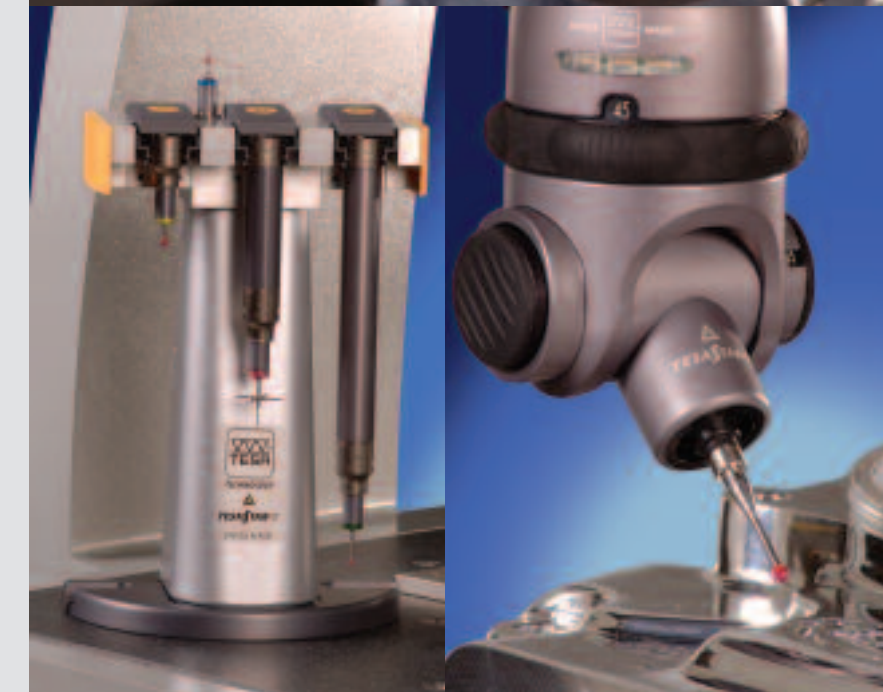
The TESASTAR-p is an M8 threaded 5-way touch probe. There are four variations available, providing variable trigger force from 0.05 N to 0.10 N.

TESASTAR-r probe autochange rack

Used in automatic exchange mode, TESASTAR-r coupled with the TESASTAR-m motorized probe head is a fully automatic active probe changing solution, which accommodates multiple probe types, with or without extensions. The rack is also fully modular, and can be configured with three to nine changing ports, or any number in between. You don't have to buy ports you don't need, and you can add one or more ports later should your needs change.

TESA stylus kits

TESA offers a full range of standard ruby-tipped styli for general measurement applications. These styli are compatible with standard probes from any manufacturer.



System integration for global

In some cases, integration of metrology equipment with other production systems is required. Integration requirements can include automated loading and unloading, pallet systems, visual operator feedback such as stack lights, or other external systems that are integrated into the measurement system. Additionally, some production requirements may necessitate placing a machine in a location that exceeds the standard thermal or vibration specifications.

To help customers with custom applications and integration, Hexagon Metrology offers system integration services. A qualified staff of engineering professionals who have expertise integrating Global machines into many types of production environments is available. Global models sold with custom integration are often equipped with active vibration isolation systems, protective environmental enclosures, manual and automatic loading systems, and safety devices.



Standard packages & options

GLOBAL Classic

	PROBE HEADS	PROBES	TOOL RACKS	SOFTWARE	TEMP COMP	ENVIRONMENT	DYNAMICS
Typical	TESASTAR-I	—	—	PC-DMIS PRO	—	18-22 deg C	max. velocity = 520 mm/s max. accel = 1732 mm/sec ²
Additional Options	TESASTAR-m MH20i PH10T PH10M/Q	TESASTAR-p TP20 TP200	TESASTAR-r MCR20 SCR200 ACR3**	PC-DMIS CAD PC-DMIS-CAD++	CLIMA	16 -26 deg C	

GLOBAL Performance

	PROBE HEADS	PROBES	TOOL RACKS	SOFTWARE	TEMP COMP	ENVIRONMENT	DYNAMICS
Typical	TESASTAR-m	TESASTAR-p	—	PC-DMIS CAD	CLIMA	18 - 22 deg C 16 - 26 deg C	max. velocity = 520 mm/s max. accel = 1732 mm/sec ²
Additional Options	PH10T PH10M/Q LSP-X3 LSP-X5*	TP20 TP200 SP25	TESASTAR-r MCR20 SCR200 FCR25** ACR3** LEITZ	PC-DMIS-CAD++			

GLOBAL Advantage

	PROBE HEADS	PROBES	TOOL RACKS	SOFTWARE	TEMP COMP	ENVIRONMENT	DYNAMICS
Typical	TESASTAR-m	TP200	—	PC-DMIS CAD++	CLIMA	18 - 22 deg C 16 - 26 deg C	max. velocity = 866 mm/s max. accel = 4330 mm/sec ²
Additional Options	PH10M/Q LSP-X3 LSP-X5*	TESASTAR-r TP20 SP25 Laser***	SCR200 TESASTAR-r MCR20 FCR25** ACR3** LEITZ		ACTIV****		

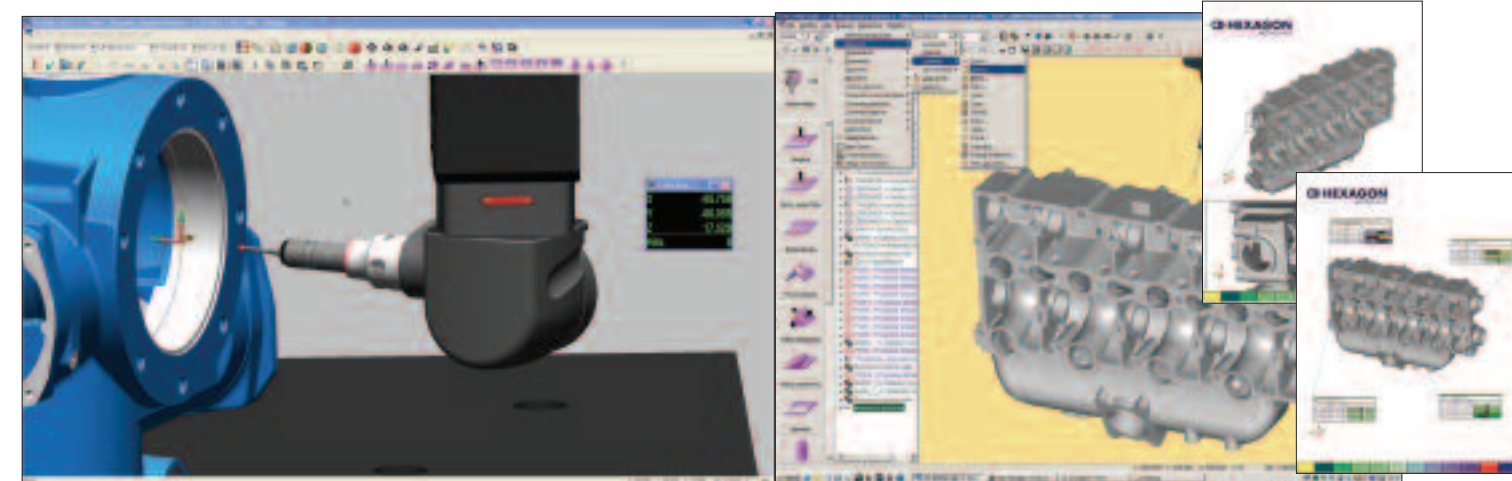
Notes:

*LSP-X5 only valid on size 9128 and higher.
**MRS rail kit required
***Laser probes including point, line, and cross-scanner.
****Not available on 575

PC-DMIS® Inspection software



PC-DMIS measurement and inspection software provides the most comprehensive solution to any kind of metrology application. PC-DMIS is available in three different versions and with a number of options packages.



PC-DMIS PRO® full-featured metrology software

PC-DMIS PRO provides an intuitive graphical user interface (without CAD), including a suite of wizards to help operators quickly learn and manipulate key inspection functions.

Features include:

- A full programming environment including high level programming functions.
- Customizable menus.
- Quick Start™ routines for probe qualifications, part alignments and hyper reporting functions.
- A full suite of customizable reporting and advanced Hyper Reporting tools.
- Intuitive Probe and Go™ to automatically recognize feature types and create interactive graphical part representations.



PC-DMIS CAD® adds the ability to import CAD files

PC-DMIS CAD includes all PC-DMIS PRO functionality, plus:

- Full 3D animation capability including digitized images of parts and fixtures on the machine so operators can visually verify the set-up and program prior to actual part inspection.
- Unknown part documentation to generate computer models for reverse engineering applications.
- Link to CAD bi-directionally using built-in DES, DMIS, DWG, DXF, IGES, STEP, STL, VDAFS, and XYZIJK translators.
- A Direct CAD Interface™ (DCI) option to create part programs directly from CAD models utilizing the native CAD system algorithms and tools. Connect to many popular CAD systems, including Unigraphics, Solidworks, Pro-E, CATIA V5, IDEAs, and ACIS.
- A Direct CAD Translator™ (DCT) option allows the use of a native CAD model even when the specific CAD system is not owned by the user. Transform files from a variety of CAD systems, such as Unigraphics, Pro-E, and CATIA V5.



PC-DMIS CAD® ++ adds scanning And thin-walled parts

In addition to all PC-DMIS PRO and PC-DMIS CAD functionality, PC-DMIS CAD++ incorporates scanning and digitizing functions that allow fast and efficient measurement of complex shapes such as turbine blades, dies, models, sheet metal components and other curved shapes.

Features include:

- Rotary, patch, linear open and closed loop scanning.
- Perimeter, section, UV and edge point scanning.
- Complete probe simulation.
- Full thin-wall feature measurement suite.

PC-DMIS algorithms are PTB certified

