

ATOS Core

Optical 3D Scanner

3D coordinate measurement
Mobile – stationary – automated
Quality control and reverse engineering

Optical 3D Measuring Technology

In Industrial Quality Control

Optical 3D coordinate measuring machines are replacing tactile measuring systems and gages in many areas of industry. They capture more detailed and easier to interpret quality information about an object with significantly shorter measuring times.

While mechanical measuring systems capture data in a point-based or linear manner, optical measuring systems provide full-field data about deviations between the actual 3D coordinates and the CAD data. As this measuring data contains all the object information, in addition to the surface deviations from the CAD, the software also automatically derives detailed information such as GD&T, trimming or hole positions.

The accuracy of optical measuring machines is not due to expensive and high-maintenance precision mechanics, but is rather based on state-of-the-art optoelectronics, precise image processing and mathematical algorithms. A few precision standards and calibration that can be performed by the customer ensure the accuracy of the machine. This also means no loss of accuracy due to wear under harsh conditions. As with the tactile machines, measuring uncertainty is certified with the help of ball bars or step gages.

Over 14,000 GOM measuring systems worldwide ensure the dimensional quality of automotive, sheet-metal, cast and injection molded products as well as turbine blades and wheels. In most cases, the detailed analyses are not used for a simple "OK" / "not OK" evaluation, but form the basis for the optimization of production and machine parameters as part of a value-added measuring procedure.



ATOS Core – Optical 3D Scanner

ATOS Core is the specialist for the three-dimensional measurement of small components up to 500 millimeters in size. The sensor forms the basis for a diverse range of measuring tasks – from simple 3D scanning to fully automated measurement and inspection processes.

Optics and electronics are integrated in very small installation space for the first time. Its compact shape gives the sensor high stability and allows measurements to be taken in confined spaces. This makes the ATOS Core ideal for the three-dimensional measurement of small and medium-sized objects such as ceramic cores, and cast or plastic parts. Depending on resolution requirements and measuring field sizes, the easy-to-handle sensor heads can be replaced easily via a quick release, without the need for re-calibration.

The scope of delivery includes the ATOS Core sensor head, an image processing computer as well as cables and accessories in a practical transport bag. For manual operation, you can choose between a studio stand, a tripod or a desk stand. The complete package of the Essential Line product line also includes the “GOM Scan” software for simple scanning tasks, optionally with 2M or 5M sensor driver. The Professional Line uses the ATOS Professional software for a comprehensive shape and dimension analysis.



ATOS Core

For Scanning Tasks with High Data Quality

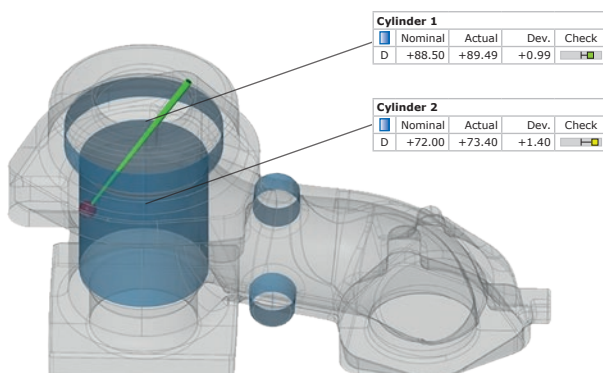
ATOS Technology

The ATOS sensor technology has been continuously developed and refined by GOM since its introduction in 1995. Due to their proven measuring technology, the ATOS systems from GOM have established themselves as the preferred measuring system in virtually all industries. The ATOS Core is currently available in seven model ranges for various different applications.



Triple Scan Principle – Precise fringe patterns are projected onto the surface of the object and are recorded by two cameras, based on the stereo camera principle. As the beam paths of both cameras and the projector are calibrated in advance, 3D surface points from three different ray intersections can be calculated. The result is complete measuring data without holes or faulty points, even in the case of reflective surfaces and objects with indentations.

Blue Light Technology – GOM projection technology works with narrow-band blue light, which means that interfering ambient light during image acquisition can be filtered out. The light sources are so powerful that short measuring times can be achieved even on uncooperative surfaces.



Live tracking – The online measurement is used for the selective alignment and positioning of components for CAD. For example, components can be aligned in their nominal position in such a way that online positioning is possible within the assembly.

GOM Touch Probe – The GOM Touch Probe combines full-field ATOS measurements with tactile 3D measurements of individual measuring points. That enables the selective measurement of areas that are difficult to access optically and the measurement of regular geometries and their direct comparison with CAD data.





GOM Adapter – The GOM Adapters provide additional options for live measurement, such as component alignment or the measurement of regular geometries and edges.

Self-monitoring system – The ATOS Core is a self-monitoring system. The sensor recognizes changing ambient conditions during operation and is able to compensate these changes.

Essential Line

The ATOS Core Essential Line with the GOM Scan software is designed for simple scanning tasks. Its focus is on 3D scans of high data quality for applications such as reverse engineering or rapid prototyping.

The GOM Scan software is an easy-to-use measurement software for intuitive operation that controls the ATOS Core sensor and at the same time processes the recorded 3D surface data to high-quality 3D grids and provides it in STL format. An upgrade to the Professional or Kinematics Line is possible at any time if the requirements or measuring tasks change.

Pattern Displacement				
	Nominal	Actual	Dev.	Check
X'	+0.00	-0.08	-0.08	
Y'	+0.00	-0.01	-0.01	
Z'	+0.00	+0.13	+0.13	

+0.28 +0.03 -0.13



ATOS Core

For Comprehensive Shape and Dimension Analysis

Professional Line

The ATOS Core Professional Line is available for comprehensive shape and dimension analysis. Parametric inspection can be used to completely trace and link all actions and analysis steps in the software. Further functions include selective projection and back projection as well as dynamic referencing for tracking, touch probe and adapter applications.



ATOS ScanPort – GOM has developed an optical desktop scanner for the measurement and inspection of small components. Recurring measuring tasks in particular are simplified with the fully automated rotation, swivel and linear axes.

The movements can be recorded with the Motion Replay software functionality - without the need for prior programming. Thus, when users need to measure similar parts, these measuring procedures are simply called up.

Kinematics Line

The ATOS Core Kinematics Line is for the automated measurement and inspection of small components. The robot-guided sensor is integrated in the ready-to-use ATOS ScanBox measuring cell, thus enabling efficient quality control in the production process. The ATOS ScanBox is an optical 3D measuring machine for fully automated 3D digitizing and inspection. It combines optimized industrial components, mobility and highest safety in one device.

For the simple programming of the measurement and inspection procedures, the system is controlled via the standard ATOS Professional software with virtual measuring room (VMR). ATOS Professional includes all inspection procedures, from offline programming to data input, inspection, trend analysis, reporting and data export. For the fast acquisition of reference frames and components in automated measurements, fully integrated photogrammetry can also be added to ATOS Core.

ATOS Professional Software

In addition to the measuring system hardware, GOM also provides a process-consistent software solution from a single source, thus ensuring the smooth integration of hardware and software. The ATOS Professional software controls the ATOS 3D scanner, creates precise 3D surface data and combines complete inspection and reporting functions in one software package.

To ensure precise measuring accuracy, the GOM software packages have been tested and certified by the two institutes, PTB and NIST. The accuracy of the evaluation software is confirmed by the comparison of the results obtained with the reference results. The GOM software has been classified in category 1, the category with the smallest measurement deviations.



GOM Services

Support and Training

GOM provides its customers with support and advice throughout the entire product life cycle. GOM application engineers are employed worldwide to commission measuring systems for customers on site and in the local language, or to provide user-specific advice on a measuring task. By email and on the phone, the GOM Support Team not only provides answers to questions relating to software and hardware, but also to applications and processes. An individual update program allows GOM customers to benefit from the latest product developments.

The aim of GOM is not only to provide measuring systems, but also the corresponding technological expertise. GOM provides standardized training courses worldwide for beginners and advanced users for this purpose.

In the GOM Service Area under www.gom.com/service, registered customers are given access to user manuals and application-specific video tutorials. A knowledge database also provides various articles with information on hardware and software. In discussion forums, users also have the option of asking questions and exchanging their experiences with other users and GOM experts.



ATOS Core

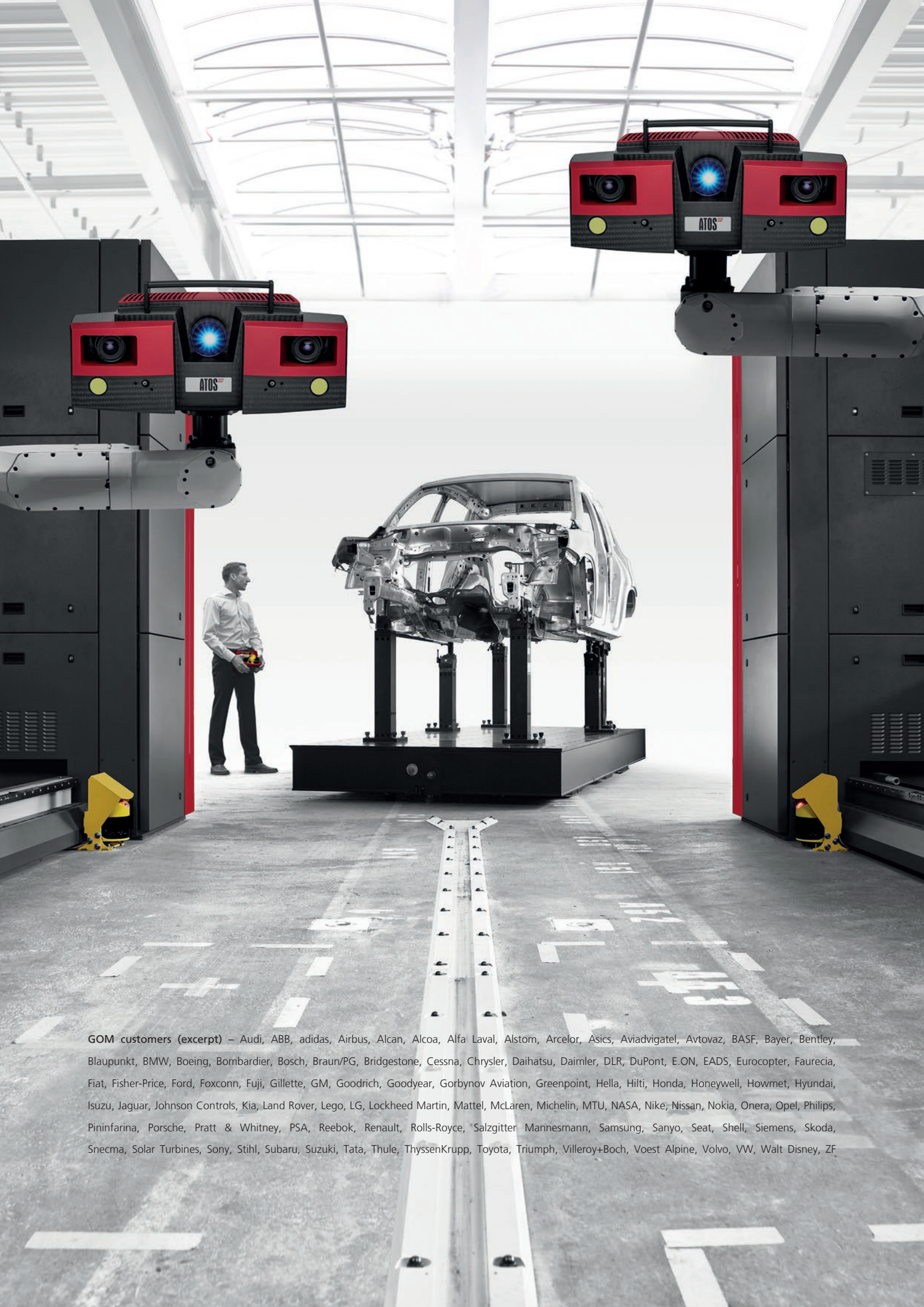
The ATOS Core is available in seven versions with different measuring volumes. Depending on the resolution and the size of the measuring field, permanently preset sensor models can be replaced quickly and reliably according to the hot-plugging principle.

	ATOS Core 45	ATOS Core 80	ATOS Core 135	ATOS Core 200	ATOS Core 185	ATOS Core 300	ATOS Core 500
Measuring Area [mm]	45 × 30	80 × 60	135 × 100	200 × 150	185 × 140 mm	300 × 230 mm	500 × 380 mm
Working Distance [mm]	170	170	170	250	440	440	440
Sensor Dimensions [mm]	206 × 205 × 64	206 × 205 × 64	206 × 205 × 64	206 × 205 × 64	361 × 205 × 64	361 × 205 × 64	361 × 205 × 64
Weight [kg]	2.1	2.1	2.1	2.1	2.9	2.9	2.9
Temperature Range	+ 5 °C to +40 °C, non-condensing						

Accessories and Options

There are various different software packages for the ATOS Core, according to requirements. The focus of GOM Scan is on 3D grids, ATOS Professional provides comprehensive functions for parametric inspection.

		Essential Line	Professional Line	Kinematics Line
Software	GOM Scan	■	–	–
	ATOS Professional	–	■	■
Automation Software	Motion Replay	–	■	–
	Virtual measuring room (VMR)	–	–	■
Sensor Driver	2M sensor driver	2 million points per measurement	–	–
	5M sensor driver	5 million points per measurement	–	–
	Triple Scan sensor driver	–	■	■
Stand	Studio stand	■	■	–
	Tripod	■	■	–
	Desk stand	■	■	–
Automation Options	Rotation table	■	■	–
	ATOS ScanPort	–	■	–
	ATOS ScanBox	–	–	■
Photogrammetry	Manual	TRITOP-based	TRITOP-based	–
	Automated	–	–	ATOS Plus
Dynamic Referencing	GOM Touch Probe	–	■	–
	GOM Adapters	–	■	■
	Tracking	–	■	■
Inspection	Parametric inspection	–	■	■
	CAD import basic formats (IGES, STEP, ASCII,...)	With free GOM Inspect software		■
	CAD import native formats (CATIA, UG/NX, Pro/E Creo Parametric)	–	■	■



GOM customers (excerpt) – Audi, ABB, adidas, Airbus, Alcan, Alcoa, Alfa Laval, Alstom, Arcelor, Asics, Aviadigatel, Avtovaz, BASF, Bayer, Bentley, Blaupunkt, BMW, Boeing, Bombardier, Bosch, Braun/PG, Bridgestone, Cessna, Chrysler, Daihatsu, Daimler, DLR, DuPont, E.ON, EADS, Eurocopter, Faurecia, Fiat, Fisher-Price, Ford, Foxconn, Fuji, Gillette, GM, Goodrich, Goodyear, Gorbunov Aviation, Greenpoint, Hella, Hilti, Honda, Honeywell, Howmet, Hyundai, Isuzu, Jaguar, Johnson Controls, Kia, Land Rover, Lego, LG, Lockheed Martin, Mattel, McLaren, Michelin, MTU, NASA, Nike, Nissan, Nokia, Onera, Opel, Philips, Pininfarina, Porsche, Pratt & Whitney, PSA, Reebok, Renault, Rolls-Royce, Salzgitter Mannesmann, Samsung, Sanyo, Seat, Shell, Siemens, Skoda, Snecma, Solar Turbines, Sony, Stihl, Subaru, Suzuki, Tata, Thule, ThyssenKrupp, Toyota, Triumph, Villeroy+Boch, Voest Alpine, Volvo, VW, Walt Disney, ZF

GOM

Precise Industrial 3D Metrology

GOM develops, produces and distributes software, machines and systems for industrial and automated 3D coordinate measuring technology and 3D testing based on latest research results and innovative technologies.

With more than 60 sites and an employee network of more than 1,000 metrology specialists, GOM guarantees professional advice as well as support and service to operators on-site in their local languages. In addition, GOM shares knowledge on processes and measurement technology in training courses, conferences and application-based workshops.

GOM has been developing measuring technology in Braunschweig since 1990. In the respective research and development departments, more than 100 engineers, mathematicians and scientists shape the measuring technology of the present and the future.

Today, more than 14,000 system installations improve product quality and accelerate product development and manufacturing processes for international companies in the automotive, aerospace and consumer goods industries, their suppliers as well as many research institutes and universities.



GOM headquarters in Braunschweig, Germany



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