

TRITOP

Optical Photogrammetry System

DELTA XD



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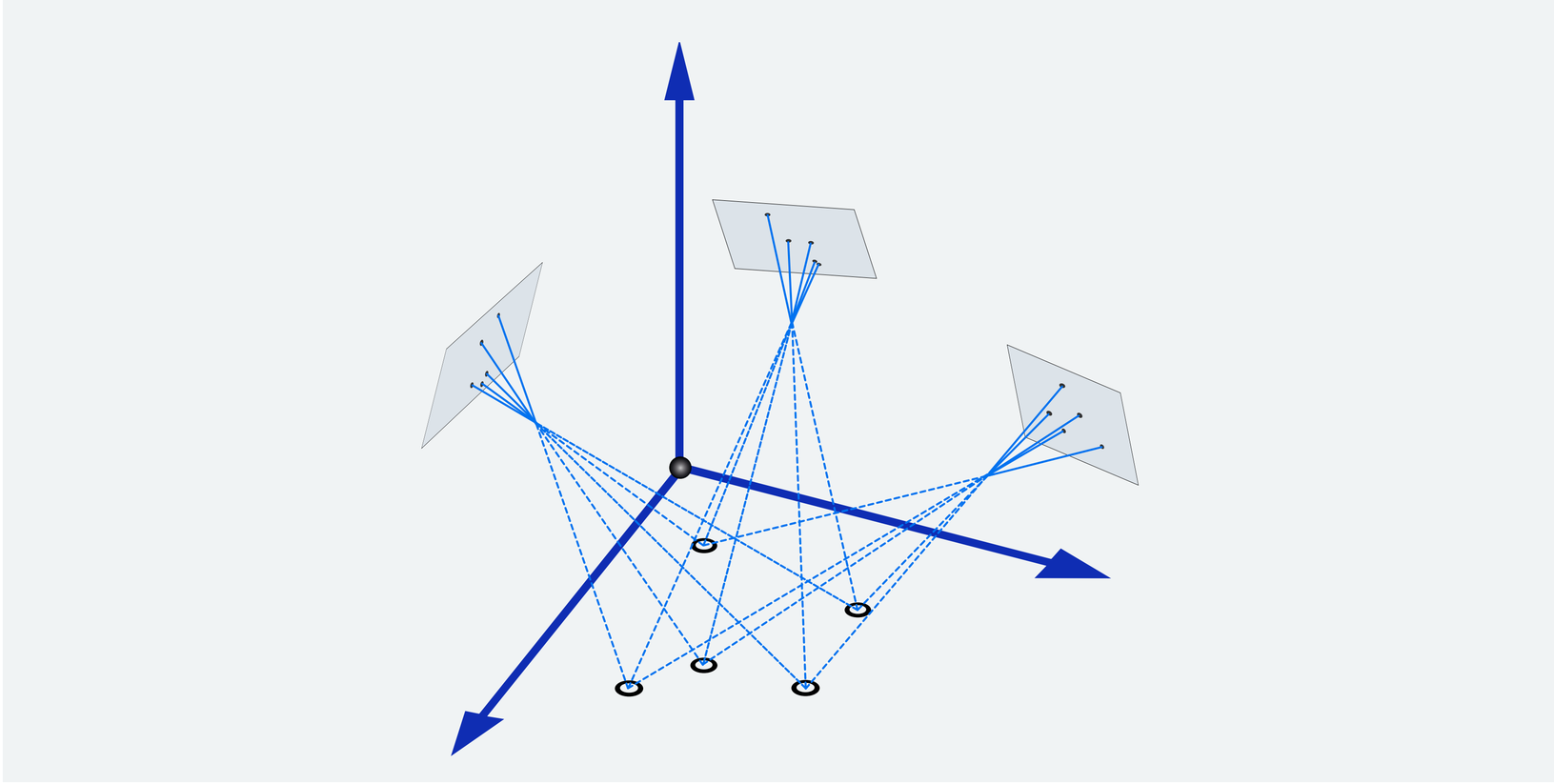
Photogrammetry

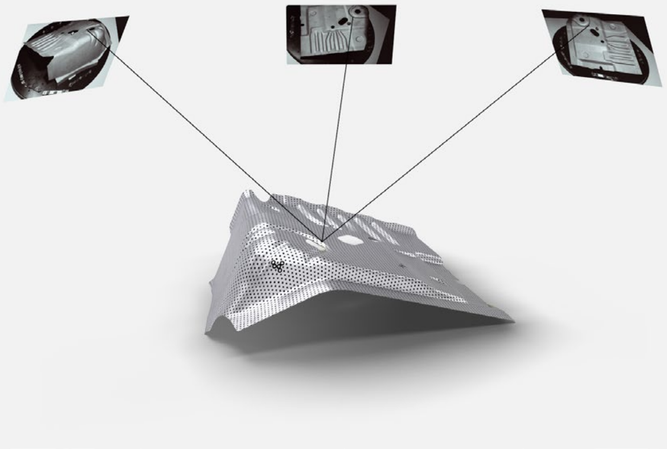
Measuring by capturing

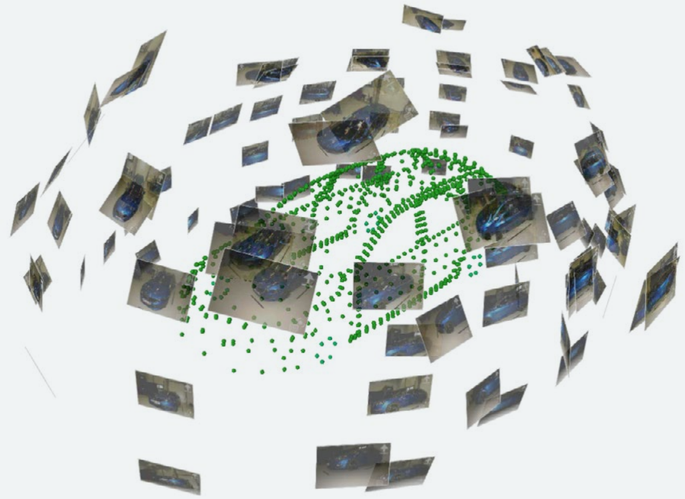
Photogrammetry is a non-contact measuring method. Pictures of the object to be measured are taken from different views with a digital measuring camera.

The position of a measuring point in space is determined by triangulation of directional bundles. Knowing the respective spatial orientation in the object coordinate system, the required 3D coordinates can be computed from the ray intersections.

Learn more







Measuring Tasks

Mastering tasks photogrammetrically

TRITOP captures precise three-dimensional coordinates of individual measuring points on objects and components. Within a short measuring time, the features, i.e. the coordinates and orientation of the respective measuring point in space, are determined photogrammetrically.

Being a mobile measuring system, TRITOP is suited for measuring tasks in 3D coordinate metrology and 3D testing. Conventional measuring methods, such as measuring tapes and batter boards, are replaced by TRITOP, along with complex displacement measuring systems and displacement transducers.

TRITOP offers a high level of accuracy, repeatability and ease of use: portable, fast and highly precise.

Learn more









Non-contact

Mobile

Robust



Fast

Intuitive

Precise

3D Coordinates

for efficient inspections

In photogrammetric measurements with TRITOP, the object coordinates are acquired using a digital measuring camera. Pictures of the object to be measured are taken from different views.

The user receives 3D coordinates for each measuring point as a 3D point cloud. The 3D coordinates can then be used to carry out various metrological analyses.

Learn more



3D Coordinates

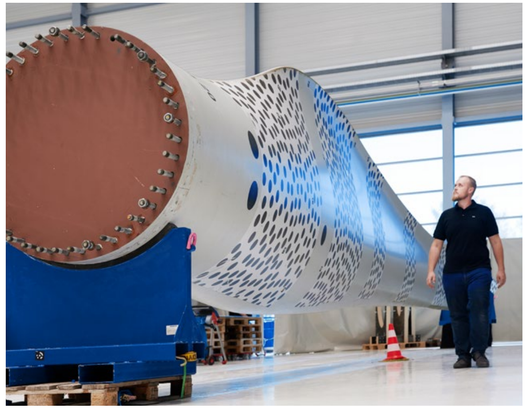
for efficient inspections



Indoor to offshore

Independent of ambient conditions

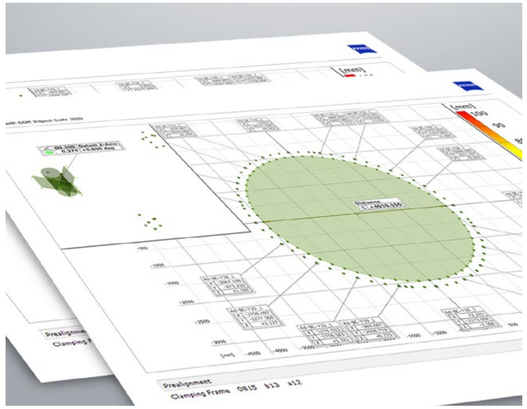
With TRITOP, objects and parts can be measured and analyzed even under harsh ambient conditions: directly on the shop floor, in a climate chamber or offshore. The system provides precise measuring results, even with challenging lighting conditions.



All object sizes

Measuring system comes to the measuring object

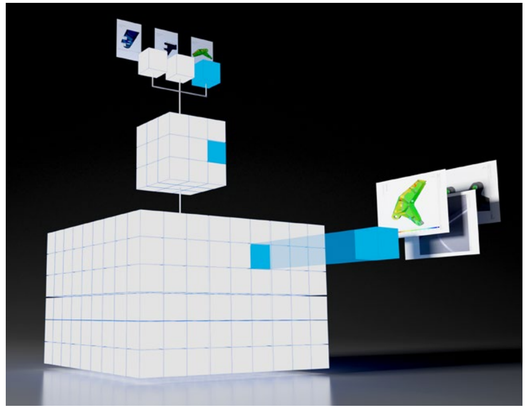
Especially when inspecting large objects, such as ships or wind turbines, TRITOP realizes the “measuring system comes to the measuring object” principle in best practice. The flexible system is at its best with parts of any size and almost any material.



Effective tool for analysis

Powerful software

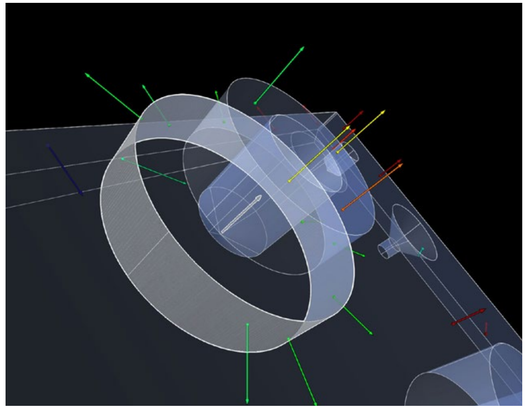
All features for inspection and analysis of ZEISS INSPECT are fully available for TRITOP as well. This analysis tool enables the visualization of measuring results, various analyses and includes comprehensive reporting functions.



Process reliability

Parametric inspection

The software allows for traceability of the computation of the inspection results. The passive parametric concept reveals the dependencies between the various elements. Whenever evaluation steps are adjusted, the affected elements are updated automatically.



Minimum training effort

Courses for all levels of expertise

In various courses, users learn how to easily handle the TRITOP photogrammetry system. Training centers offer local in-person trainings, Live Online Training sessions and time-flexible eLearning courses for all levels of expertise.

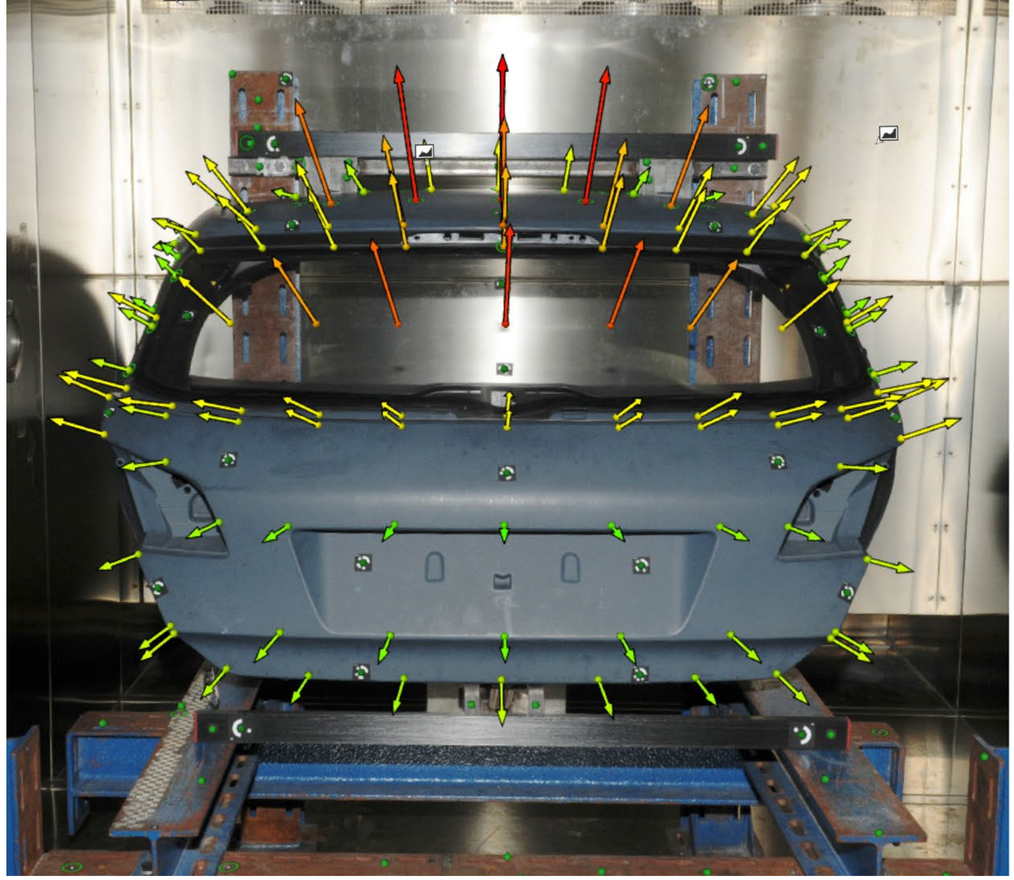
At Any Location

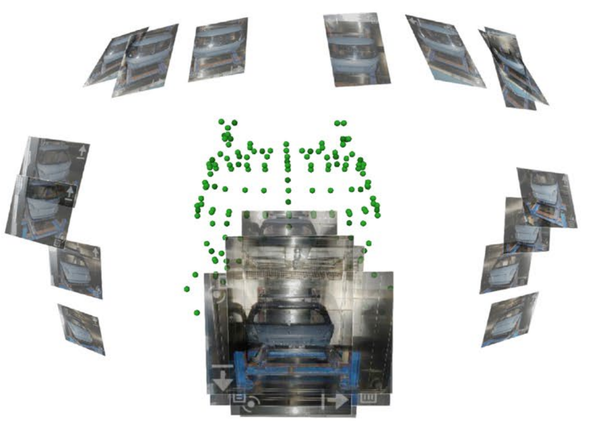
Overcoming challenges quickly

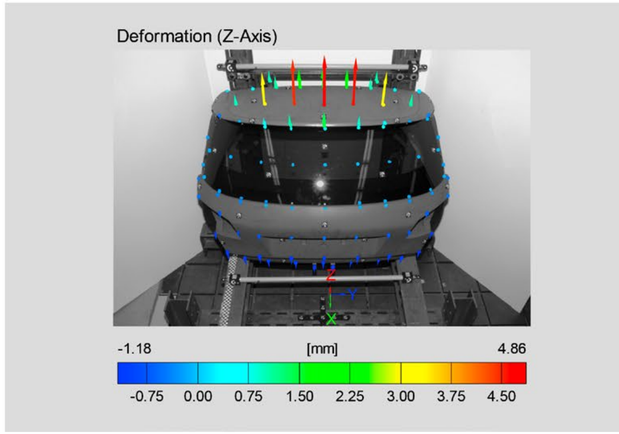
TRITOP is particularly suited for measuring very large objects and does an excellent job in the acquisition of coordinates for a wide range of inspection dimensions and object characteristics.

TRITOP masters measuring tasks in quality control and inspection as well as in modern development and manufacturing processes in a short time.

The measuring results also enable product monitoring during development, comparison with CAD data and verification of specifications from drawings, files or tables.







3D testing

Inspection of precision plastics

TRITOP supports SABIC in the development of innovative plastics for components of various industries. A typical application is the design of a metal-free trunk lid. To inspect the quality of this new plastic trunk lid, prototypes were subjected to torsional stress and thermal conditions.

These tests cannot be carried out with conventional coordinate measuring machines and high-temperature displacement sensors are too time-consuming and inaccurate for SABIC compared to photogrammetry.

Unbeatable Teams

Reference coordinates for overarching accuracy

For the precise inspection of very large and often complex parts, TRITOP captures reference point clouds in a first step. ATOS, ARAMIS and T-SCAN hawk 2 use these reference points to automatically transform the individual measurements and achieve the overarching accuracy of the photogrammetric measurement over the entire measuring area.

TRITOP + ATOS



In almost all industries, ATOS sensors have established as optical 3D measuring systems. The sensors are reliable and versatile and therefore ideally suited for measuring and inspecting complex objects.

If the measured objects are larger than the measuring area of the ATOS sensor or if a single measurement is not sufficient for complex parts, the user links the partial measurements via reference points that are captured by TRITOP. Combining ATOS and TRITOP guarantees high accuracy for large and complex objects.

Learn more

TRITOP + T-SCAN hawk 2



T-SCAN hawk 2 was developed to always be where it is needed. The lightweight, portable laser scanner is used in numerous applications and industries. A reliable tool for capturing data with metrological precision.

When measuring large objects, TRITOP provides the reference coordinates. This allows the T-SCAN hawk 2 system to orient itself in space and generate full-field data at key areas that are important for inspection and analysis.

Learn more

TRITOP + ARAMIS



ARAMIS sensors enable the dynamic acquisition of 3D coordinates, 3D displacements and 3D surface strain. Based on triangulation, the measuring systems scan precise 3D coordinates for full-field and point-based measurements.

For the seamless acquisition of deformations on large objects, several ARAMIS measuring systems are linked and synchronized with each other. The 3D coordinates are then transformed into a shared measuring project using a point cloud of reference coordinates supplied by TRITOP.

Learn more

Reach Your Objective in Just a Few Steps

Simple measuring procedure and evaluation

Regardless of whether the measuring task is in the field of 3D coordinate metrology or 3D testing: TRITOP facilitates the measuring procedure and evaluation. The software guides the user through the entire workflow in a process-reliable and user-friendly manner.

The computed 3D coordinates, displacements and deformations are graphically visualized and can be used, for example, for comparison with CAD data or for GD&T analysis.

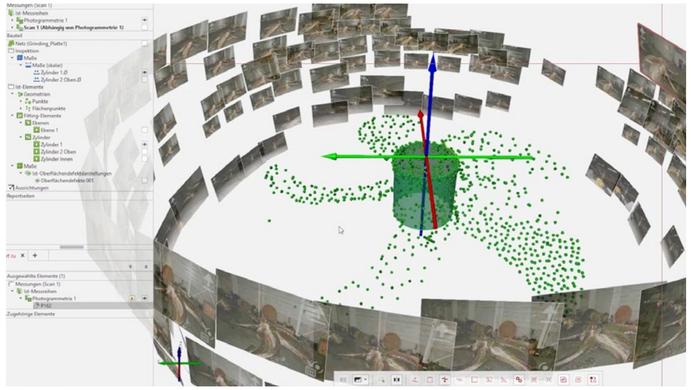
Step 1

Mark and capture



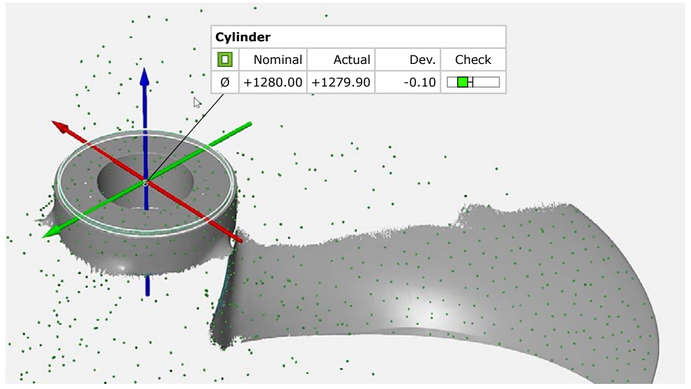
Step 2

Process and visualize



Step 3

Evaluate and document



Software tailored to customer’s needs

TRITOP comes with powerful software. It guides the user through the entire measurement and evaluation procedure in a process-reliable and user-friendly manner. The thorough support eliminates possible errors from image acquisition to evaluation, simplifies and accelerates the workflow and increases the data quality.

With ZEISS INPECT and ZEISS CORRELATE, you can visualize the measuring results and benefit from a variety of options for analysis and reporting depending on the measuring task. This analysis tool offers intelligent solutions for reliable documentation. Additional third-party software is no longer needed.

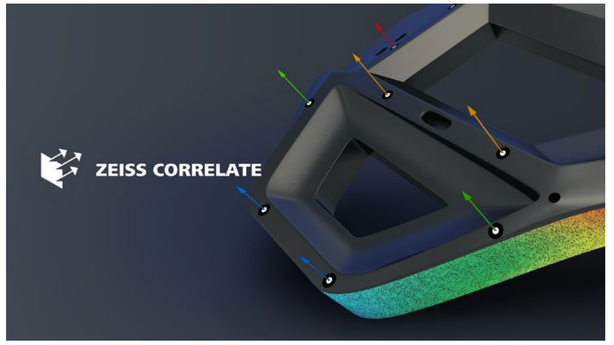


ZEISS INSPECT Optical 3D

For simple or complex inspection tasks

The stand-alone solution for 3D measurement technology is the industry standard for the entire inspection workflow. In addition to extensive GD&T analysis, it provides, e. g., options for nominal-actual comparisons and angle measurements.

Learn more

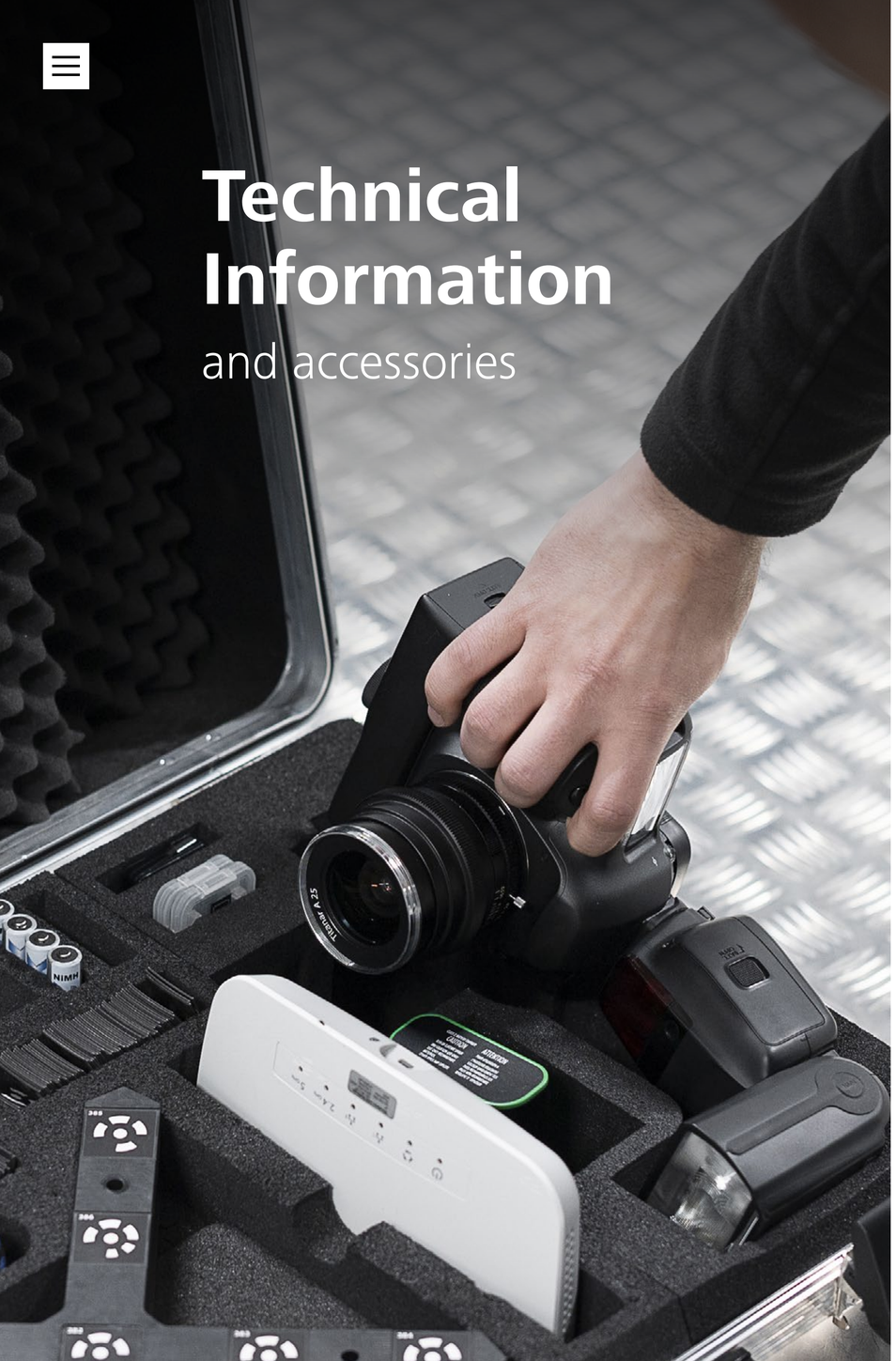


ZEISS CORRELATE

Everything in motion

ZEISS CORRELATE is an inspection software for strains, 3D displacements, 3D deformations as well as velocities and accelerations, as tested in many production-related research and development tasks. The software evaluates 2D and 3D data based on digital image correlation.

Learn more



Technical Information

and accessories

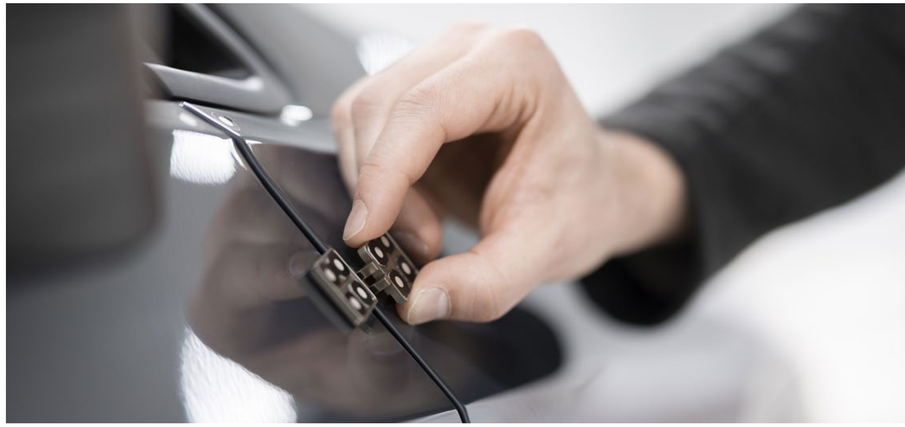


Measuring System	**TRITOP**
Image sensor	Color CMOS
Sensor dimensions	36.0 mm × 24.0 mm (full-frame)
32.5 million pixels	24 million pixels (6000 × 4000 pixels)
Dimensions (camera housing)	Approx. 158 × 150 × 87 mm
Weight (camera housing)	Approx. 920 g
Camera lens	Titanar A 25 (RF Mount)
Image transmission via WiFi	WiFi transmitter included
Operating condition temperature	0 °C to +40 °C
Operating condition humidity	Up to 85 % (non-condensing)
Software	ZEISS INSPECT Optical 3D, ZEISS CORRELATE









Marking material

Reliable detection of measuring points

For all common measuring tasks, TRITOP is supplied with a comprehensive set of coded and uncoded reference point markers. For particularly large and complex objects, additional reference point markers can be used to achieve a high level of accuracy.

Adapters

Versatile functionalities

With the help of precisely measured adapters, TRITOP extends its functionality by the measurement of standard geometries. Individual adapters for threads, holes, edges and bolts help to automate alignments and reporting.

Linear scale bars

Certified and robust

Each TRITOP system is supplied with two DAkkS-calibrated linear scale bars, which ensure the dimensional accuracy of the measured object coordinates. The linear scale bars are lightweight, robust and characterized by a small linear expansion coefficient.

Telescopic rod

Easy to adjust to the object size

The compact TRITOP extension, which can be extended to a length of up to four meters, enables the optimum distribution of camera positions for large objects – making ladders or scaffolding redundant. The measuring camera, which is mounted on an adapter plate, also captures very high, hard-to-reach areas using a remote release.

Did TRITOP Get Your Attention?

Contact us for a free demonstration – on site or online.

Contact us

Certified Metrology Partner