



# SMARTTECH3D PHOTOGRAMMETRY

SMARTTECH3D photogrammetry is a portable coordinate measuring system based on digital photographs. It creates a digital map of markers placed on the object that can be used for direct quality control or bundled with optical full field measurement. The system is designed for 3D scanner referencing at high-end industrial applications for large objects. Thanks to full integration with SMARTTECH3D scanners it enables users to scan crucial elements of big objects with high accuracy in the same coordinate system.

Enrolling photogrammetry in 3D scanning process allows combining high resolution scanning with overall dimension quality control while reducing time of optical scanning by focusing on critical points of a scanned part.

## TYPICAL USE - CASES:

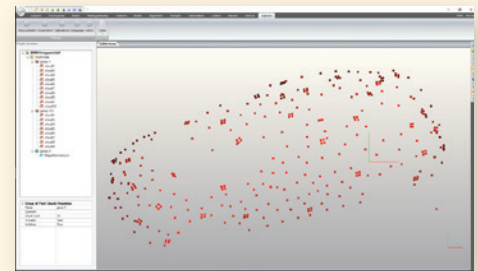
- Marker map for high resolution 3D scanning of large-size objects
- Point to point stand-alone quality assurance for large-size objects
- Assembly control in automotive, ship and steel construction industries

## ADVANTAGES OF SMARTTECH3D PHOTOGRAMMETRY

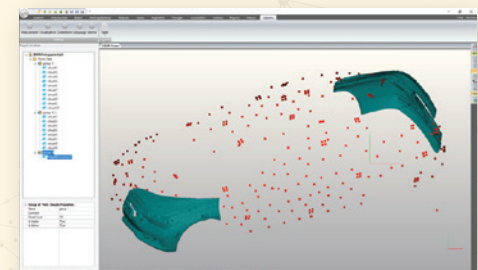
- Easy to carry - system weight ca. 5kg
- Usable in bright daylight as well as for dark objects
- High precision for objects up to 20m and more
- Insensitive against shocks and vibrations
- Robust for a large range of temperatures

## ACCURACY & EVALUATION

Both photogrammetry and 3D scanning process are evaluated accordingly to VDI/VDE 2634 standard. Base accuracy of photogrammetry map reaches 92  $\mu$ m, while precision of 3D scanning is dependent on the model of used 3D scanner reaches up to 10  $\mu$ m giving numerous possibilities of applications.



Generating a map of markers based on photos



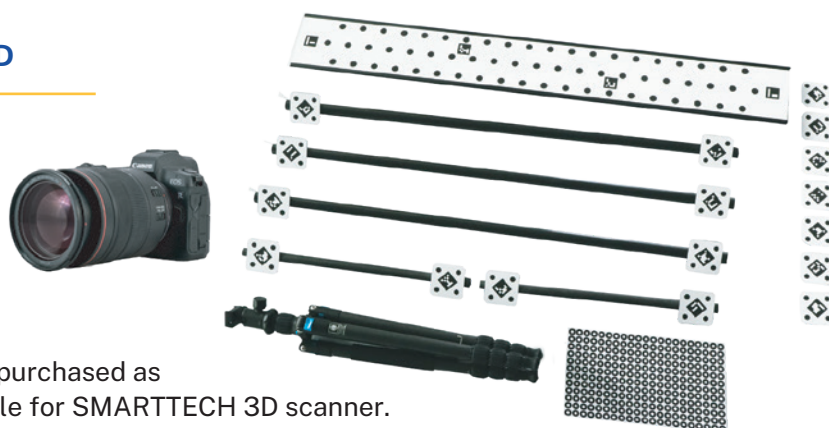
Integrated data from photogrammetry and 3D scanning

## PHOTOGRAMMETRY SET STANDARD

Set consists of:

- calibration plate
- scale bars
- numeric and round targets
- dedicated Canon camera with flash
- SMARTTECH3Dmeasure software

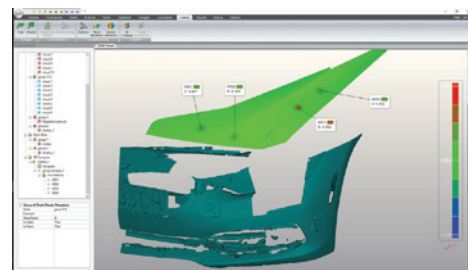
SMARTTECH3D Photogrammetry can be purchased as stand-alone system or as additional module for SMARTTECH 3D scanner.



## PHOTOGRAMMETRY PROCESS - HOW IS IT DONE:

Photogrammetry bases on high resolution photos taken of measured object with specially designed markers and scale bars. Those images are input data that serve for calculation to obtain precise marker map of the object. This means that as a first step of the process user places self-adhesive or magnetic markers and scale bars on the object. Second step requires taking several dozen photos from a different perspective depending on the size and complexity of project. Gathered data is calculated in SMARTTECH3Dmeasure software into map of markers. The map can be directly used to perform measurements, quality and dimension checkup for applications where point to point measurements are sufficient. In such case for further analysis the user can use only coordinates of points visible on the map.

The highlight of the system is specially revealed when using it as additional module for SMARTTECH 3D scanners. The metricmarker map created using photogrammetry is compatible with point clouds from SMARTTECH 3D scanners. It is possible to add high-resolution results from 3D scanning of a given area to the created map of markers. All data is placed in one coordinate system. This gives the possibility of comprehensive quality control of the entire large-size object (markers map) and a detailed analysis of the selected fragment (scan 3D).



Color map of deviation with check points

**SMARTTECH3DMEASUREMENT SOFTWARE** with active photogrammetry module guarantees full integration of photogrammetry and optical scanning process in one software. Additionally it gives the user a tool to perform further quality control based on given CAD reference.



## QUALITY CONTROL TOOLS

Based on the customer's needs, the software has been equipped with basic tools needed for quality control, such as a color deviation map of the measured object and CAD reference, distance measurement, cross section, and both area and volume measurements. These features give the user the possibility to create a quality control report (PDF file) directly from SMARTTECH3Dmeasure software.

## VISUALIZATION OF MEASUREMENT RESULTS ON THE OBJECTS

Software enables projection of points or lines and gives the possibility to display a deviation map directly on the scanned object. This allows to mark places that need special attention from your staff during the ongoing production process. Sharing your remarks has never been easier - this time they simply appear on your object.