Launching the innovative concept of an intuitive-to-use high-precision laser scanner a few years ago, Steinbichler Optotechnik, as the first company worldwide, translated the idea of an optically tracked handheld scanner into an industrial-strength system solution. Over two decades of expertise in optical measurement and sensor technology provide the basis for the continuous further development of our digitizing systems, which always reflect the latest state of the art and shape the global market in many application areas.

T-SCAN 3 now takes the system to a higher level with its dynamic, compact and ergonomically optimized design: The extremely light-weight handheld unit allows effortlessly capturing the 3D coordinates even of large objects without tiring the user.

The high accuracy and superior data quality make the system excellently suited even for demanding applications such as measurement tasks in quality assurance.

Using T-SCAN 3, the digitization of objects featuring different and/or varying surface characteristics is easily done without any time-consuming object preparation. Owing to its automatic point-to-point intensity control, the laser scanner captures even shiny or matt-finished areas without difficulty.

T-SCAN 3 is the ideal scanning solution for a wide range of applications:
- Quality Control / Inspection
- Comparison to CAD data
- Boundary/edge extraction (measurement of sheetmetal parts)
- Serial inspection in production (manual/automated)
- Mold and Toolmaking
- Tool reconstruction
- Generation of milling tool paths
- Documentation of actual 3D data at tool release
- Design
- Scanning of design models for further processing of CAD data and documentation
- Rapid Manufacturing
- Acquisition of 3D data for Rapid Prototyping
- Reverse Engineering
- 3D Scanning
- Scanning of art/historical objects, archaeology
- Medical technical applications, etc.
T-SCAN 3 makes 3D digitizing exceedingly simple: With its light, well-distributed weight and its special cable guide, the compact, ergonomic handheld laser scanner is designed for maximum ease of use.

Besides its high temperature stability, the scanner features optimally oriented IR marker positions as well as enhanced calibration methods and algorithms that provide for excellent data quality. With its significantly increased sampling rate, the T-SCAN 3 is especially suited for all kinds of inspection applications.

During the scanning process, the captured data is displayed in real-time on the monitor - which ensures a particularly efficient workflow.

A new, additional scanner version for the digitization of high gloss, black and shiny surfaces or CFRP materials is now available, delivering excellent measurement results for the most challenging applications.

Different handling systems are available for the positioning of the tracking camera to cover a wide application range. For applications requiring high mobility, an adjustable tripod can be used. With a special camera stand featuring lockable casters, a very flexible and though stable measurement set-up is available - the unit can easily be transported and assembled by one person. It is continuously adjustable in height and allows turning and tilting of the camera, and it additionally features an integrated weight compensation to ensure effortless handling.

The combined use of T-SCAN 3 with a touchprobe offers a flexible solution for the tactile and optical acquisition of 3D data, e.g., for the measurement of vehicle or workpiece coordinate systems.
Depending on the mobility requirements, T-SCAN 3 can be operated either with a 19” plug-in rack for PC and control device or with an extremely compact control unit and a high-performance notebook PC.

The handheld laser scanner T-SCAN 3 offers outstanding benefits for mobile use and delivers highly precise results for challenging measurement tasks such as production-related quality control. Through the adaptation of the laser scanner to an industry robot, fast and accurate automated measurement procedures for quality control are enabled.

- Fully automatic, efficient 3D digitization of large objects
- High accuracy
- Large measuring area
- Macro-controlled program run
- No object preparation necessary; measurement on objects with varying surface properties
- Automatic evaluation with common inspection software tools (e.g., Polyworks Inspector, Tebis)

### T-SCAN 3 SENSOR

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement Depth</td>
<td>75 mm</td>
</tr>
<tr>
<td>Scan Width</td>
<td>90 mm</td>
</tr>
<tr>
<td>Mean Measurement Distance</td>
<td>83 mm</td>
</tr>
<tr>
<td>Scan Frequency</td>
<td>10 - 140 Hz</td>
</tr>
<tr>
<td>Sampling Rate of Distance Measurement</td>
<td>20 kHz</td>
</tr>
<tr>
<td>Resolution of Distance Measurement</td>
<td>1 μm</td>
</tr>
<tr>
<td>Point Density in Scan Direction</td>
<td>0.07 - 0.98 mm</td>
</tr>
<tr>
<td>Sensor Weight</td>
<td>1200 g</td>
</tr>
<tr>
<td>Sensor Dimensions</td>
<td>172 x 138 x 80 mm</td>
</tr>
<tr>
<td>Standard Cable Length Scanner-PC</td>
<td>9 m</td>
</tr>
<tr>
<td>Lateral Resolution</td>
<td>0.1 mm</td>
</tr>
<tr>
<td>Laser Type</td>
<td>Diode</td>
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<tr>
<td>Wavelength</td>
<td>670 nm</td>
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<tr>
<td>Laserclass</td>
<td>2</td>
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</tbody>
</table>

### TRACKING SYSTEM

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement Volume</td>
<td>1.5 - 6 m</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>1126 x 200 x 161</td>
</tr>
<tr>
<td>Weight</td>
<td>approx. 19 kg</td>
</tr>
<tr>
<td>Temperature Compensation</td>
<td>yes</td>
</tr>
<tr>
<td>Display of Measurement Volume with Laser Pointer</td>
<td>yes</td>
</tr>
<tr>
<td>In-Field Calibration</td>
<td>yes</td>
</tr>
<tr>
<td>Touchprobe</td>
<td>yes</td>
</tr>
<tr>
<td>Extension to Portable Coordinate Measurement Machine (PCMM)</td>
<td>yes</td>
</tr>
<tr>
<td>Dual-Camera-Operation</td>
<td>no</td>
</tr>
<tr>
<td>Dynamic Referencing (Camera Repositioning)</td>
<td>yes</td>
</tr>
<tr>
<td>Mobile Rack and Notebook Operation</td>
<td>yes</td>
</tr>
</tbody>
</table>
The T-SCAN plus measuring and evaluation software (64-bit OS Windows XP/64 compatible) leverages the latest hardware technology, such as dual or quad cores. By parallel processing and multithreading it minimizes the computing time for processing the 3D scan data.

Memory usage is streamlined, as the data is automatically rastered directly after the measurement. This offers additional advantages through faster display and excellent data quality. With its accelerated post processing and the optimized generation of triangle meshes, T-SCAN plus perfectly complements the scanner system for quickly and efficiently digitizing and then further processing the data.

The new T-SCAN plus version is optimally adapted to the optical tracking system and delivers high performance for demanding applications.
T-SCANplus - FUNCTION OVERVIEW

GENERAL FUNCTIONS:
• Fast surface scanning with variable point distance
• Measuring modes for the scanning of surfaces, contour lines, 3D points, static and dynamic polylines
• Integrated 3D, 2D, and intersection viewer, optional overlay of polygon grid or coordinate axes
• Dynamic or static referencing of tracking system
• Windows XP/Windows 7 64-bit operating system with unlimited multi processor support

T-SCANplus - HIGHLIGHTS

FILE MANAGEMENT FUNCTIONS:
• Import and export functions for scan data and triangle meshes in various standard formats (IGES, AC, VDA-FS, ASCII, NC-ASCII)

MATCHING AND DATA TRANSFORMATION FUNCTIONS:
• Data transformation (based on transformation file, pre-defined values, online transformation values given by inspection software, and nominal points measured by touchprobe)
• Definition of coordinate system (3 plane alignment, 3-2-1 alignment, import of transformation parameters from inspection software)
• Constraint matching (matching with tolerance settings)
• NEW: Constraint matching with object groups, constraint matching with tie points and reference points

DATA EDITING FUNCTIONS:
• Smoothing filter for data optimization
• Interactive clipping of scan data
• Optimization of triangle meshes (remove outliers, tolerance-based smoothing, curvature-based decimation, scaling, mirroring)
• New tool for edge sharpening in STL meshes

EXTRACTION OF SECTIONS AND FEATURES:
• Calculation of optimized serial intersections
• Featureline extraction and manipulation
• Nurbs conversion of feature lines

SERVICE FUNCTIONS AND HARDWARE CONTROL:
FUNCTIONS FOR IN-FIELD CALIBRATION OF COMPLETE MEASURING SYSTEM:
• System accuracy check
• Hardware control functions for tracking system (initialization, connect to tracking system, read status, activate markers)

EXTRAS:
• Macro execution for automatization
• Online inspection using direct data transfer to INSPECTplus
• NEW: Integrated DMM functionality, internal rigid body handling

The Dynamic Referencing function (using additional LEDs attached to the object) for scanner and touch probe reliably eliminates vibration and object movement during data acquisition, e.g., during 3D digitizing of the vehicle interior.