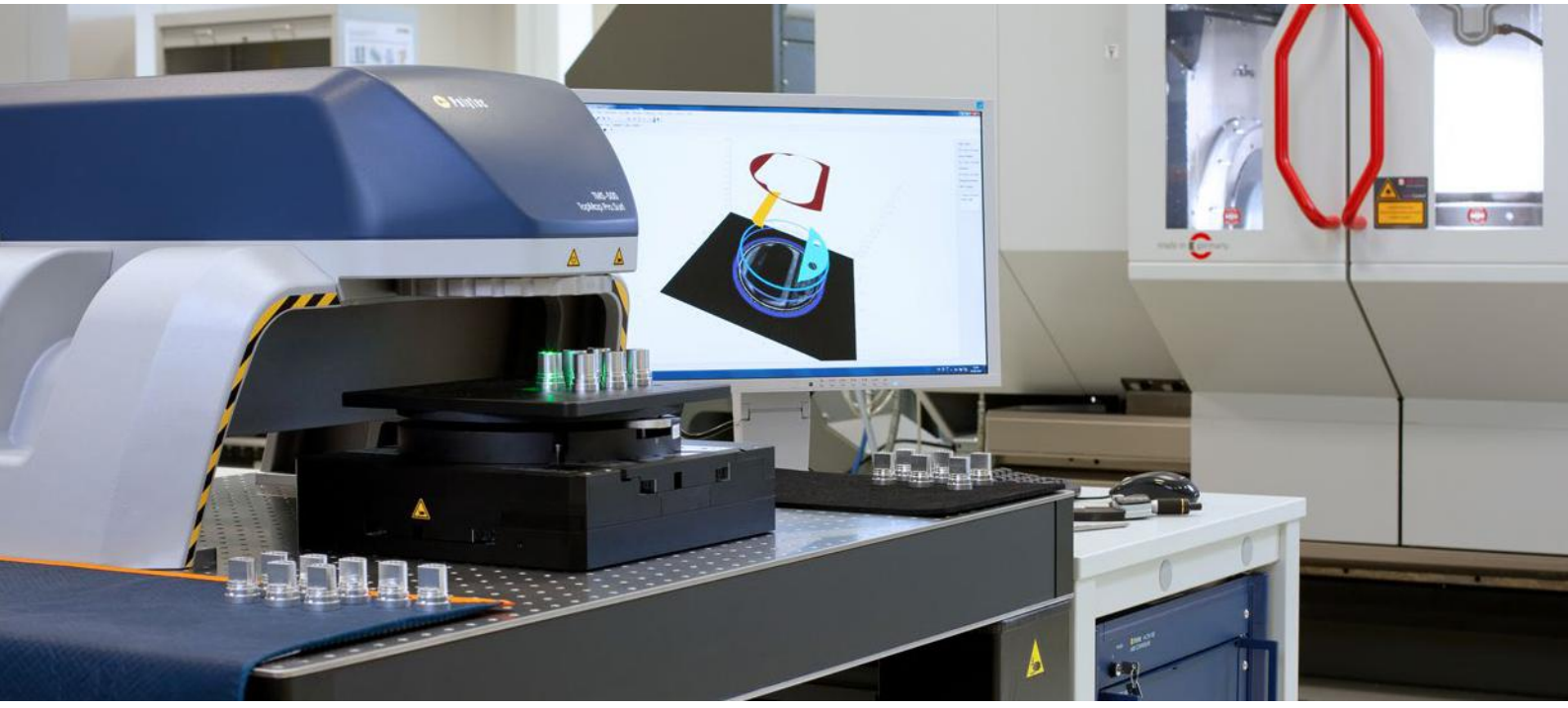
Polytec



Surface metrology for manufacturing

Tailored to your needs

Competence field

Meeting the demands of industrial surface quality control

Use optical surface metrology to characterize precision parts:

Consistent production of high quality precision parts will benefit from tightly integrating quality control (QC) metrology into the manufacturing process. Only then, the inspection feedback allows immediate and cost-efficient reactions. TopMap surface metrology systems from Polytec help adjusting manufacturing parameters and assure to stay within production tolerances.

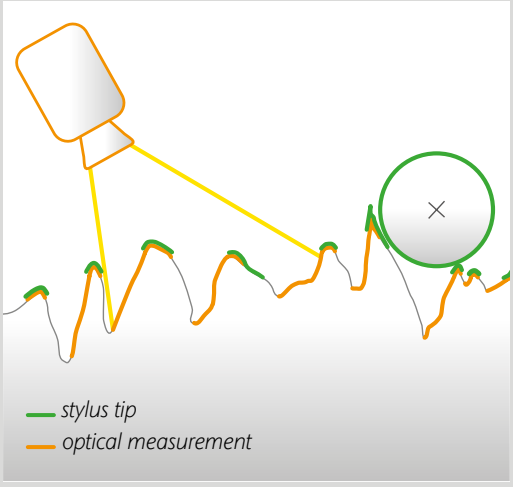
TopMap systems acquire areal topography measurement data from entire sample surfaces within short cycle times, thus supporting production throughput and providing important feedback for quality assurance. But even such fast evaluating methods may require additional adaptations. This is where TopMap surface metrology smoothens inspections in closed-loop manufacturing.

Measure fast and on large areas

TopMap white-light interferometers measure large areal surfaces without contact, and unlike conventional stylus based measurements, acquire areal topography data with millions of measurement points within seconds.

This 3D surface data is used as feedback in production environments to immediately fine-tune and maintain machining processes, thereby minimizing costs while assuring high product quality and throughput.

See more details



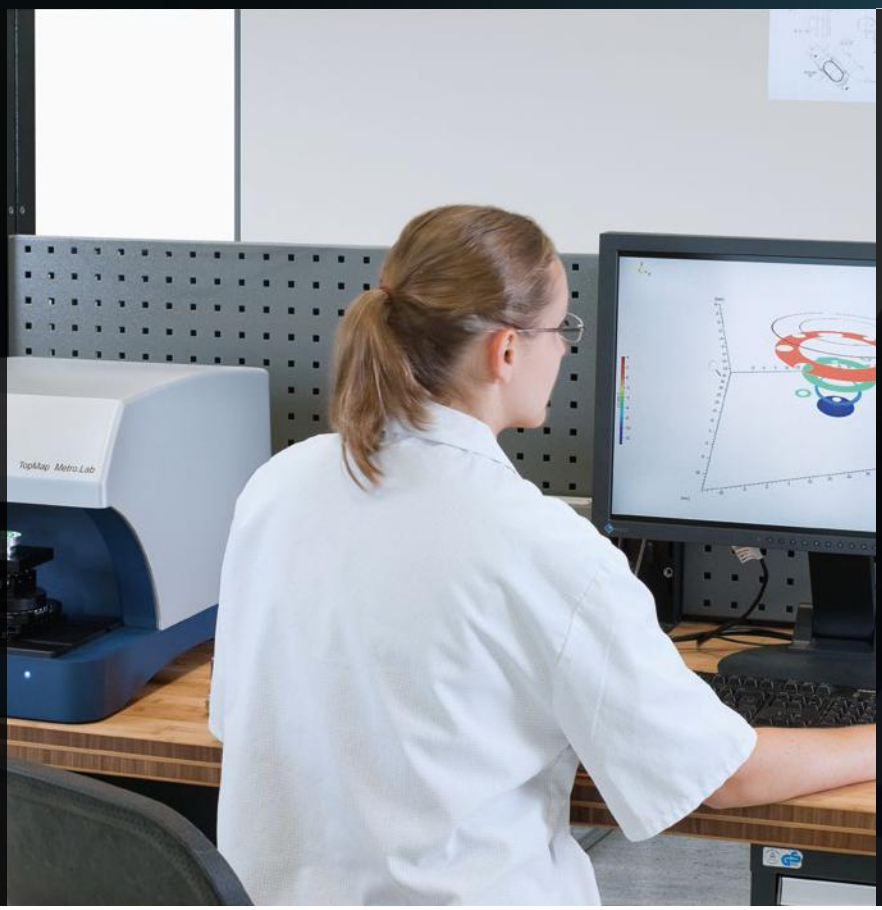
Highlights of optical surface metrology

- Areal measurement with nanometer vertical resolution
- Millions of areal measurement points in seconds
- Large field-of-view (FOV) for large samples
- Measure hard-to-reach areas like holes
- Fast measurement for short cycle times

Different applications – different challenges

There are three typical locations where surface metrology is used for quality control applications: quality laboratories where selected parts are brought for detailed analysis; close-to-production line applications located on the factory floor for relatively rapid inspection and feedback; in-line quality control for immediate, automated inspection and feedback. The optimal metrology solution must easily adapt to design changes that lead to varying optical properties, sample geometries and materials that may affect the inspection.

Quality laboratory



- Stable environmental conditions
- Well trained technicians with metrology know-how
- Deal with various samples

Close-to-production

- Harsh industrial conditions
- (Semi-)automated inspections require additional precautions
- React on unexpected modifications

See more Polytec solutions for the quality control sector like vibro-acoustic quality control, machine vision and process analytics.

Visit www.polytec.com

In-line

- Smooth integration into production line
- Time-critical and often 100 % inspections
- Cope with application-specific modifications
- Global support on different production sites required

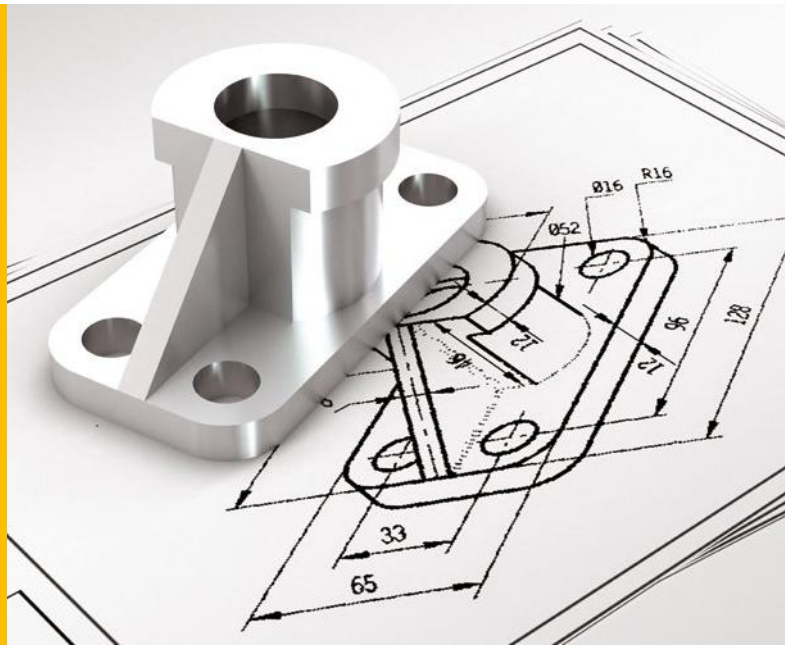
Master challenges in quality control (QC)

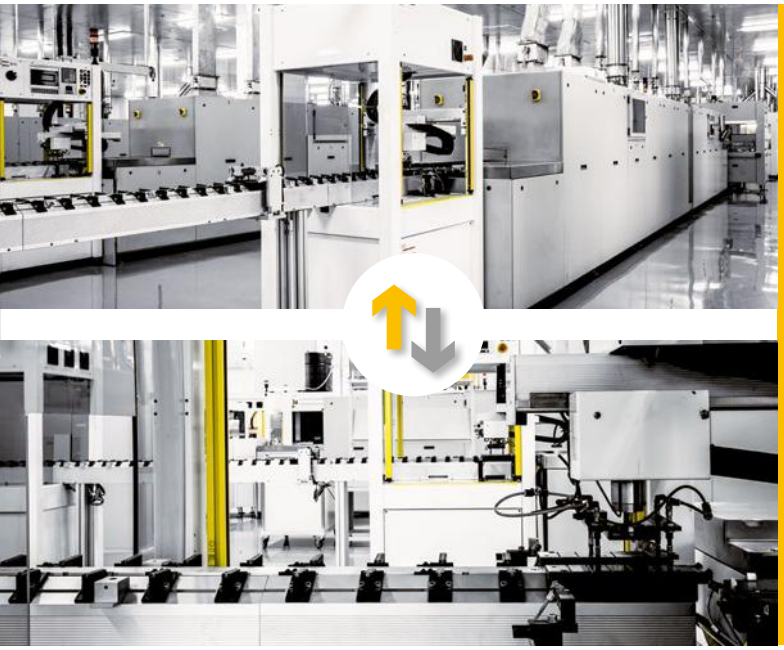
Easy integration and user-friendly operation

Installation of QC systems can be challenging depending on the levels of mechanical sensor integration and software interfacing. While TopMap's customizing options assure flexibility on the one hand, the one-click solutions on the other hand reduce complexity and potential user failures.

Prepare for the unknown

The initial engineering design almost never leads to the perfect part. The perfect manufacturing metrology solution needs to accommodate unexpected and changing situations. This could be because of design changes, incomplete information at the beginning of the product design, modified surface properties including color or shape, or varying surface properties (textures) when switching to a second-source supplier.





Traceable and reproducible throughout all locations

Establishing standards in the first manufacturing line can become the master for identical lines at different plants. But from line to line, or plant to plant, production capacities, raw material properties and user knowledge can vary significantly. Here, full traceability and interchangeability of both software settings and hardware components help synchronize the quality control at different locations.

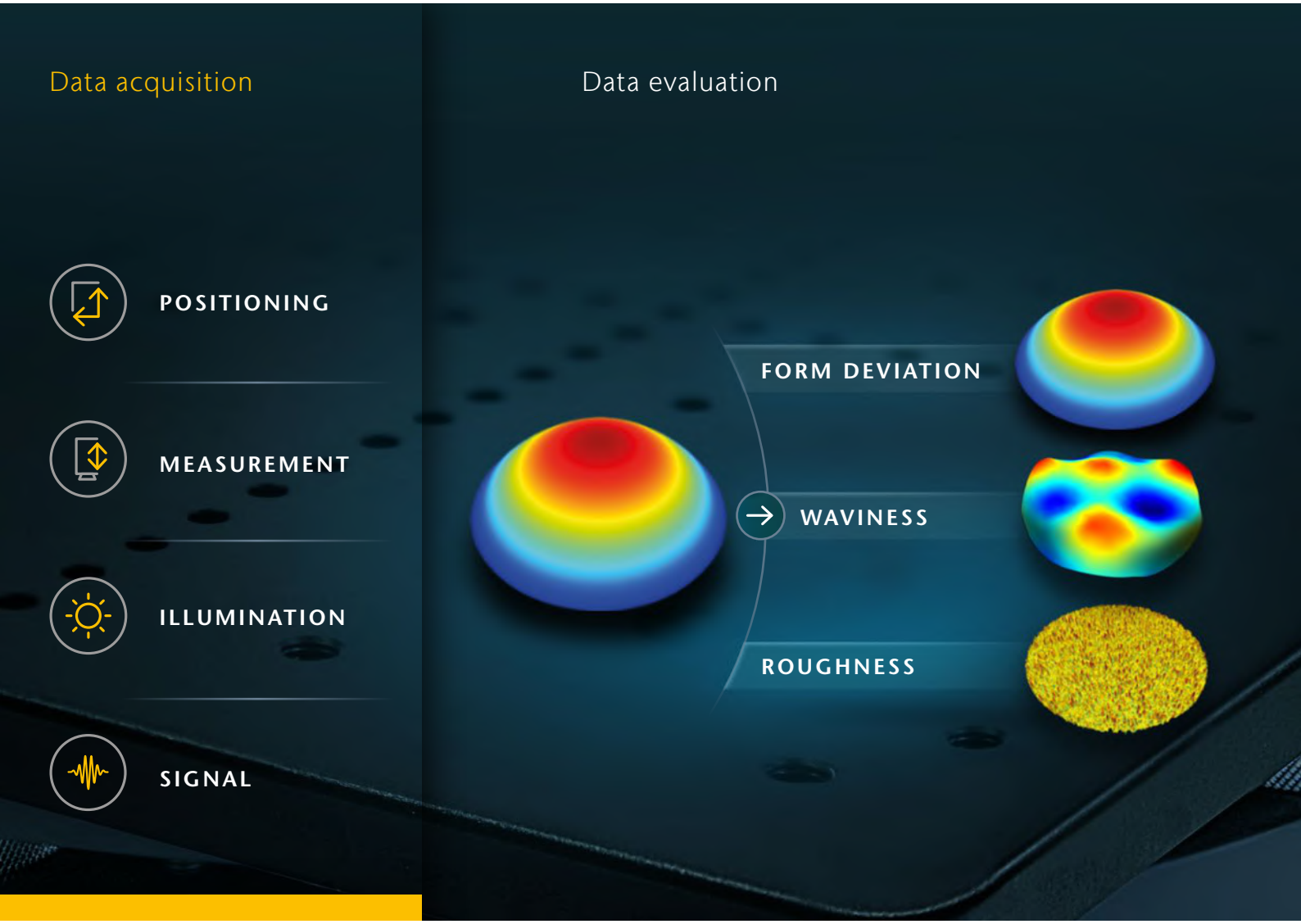
One system to measure many sample types

At quality labs or small companies, often one measurement system needs to handle many different samples. Here, flexibility is the key. Both the setup of new measurements and the reporting must be realizable also by non-expert personal.

Measurement recipes with pre-defined settings

The Polytec concept of measurement recipes allows for the saving of acquisition parameters (e.g. measurement position, illumination settings, camera parameters...) together with evaluation parameters (post-processing steps, visualization options, export possibilities...) to define a special measurement task.

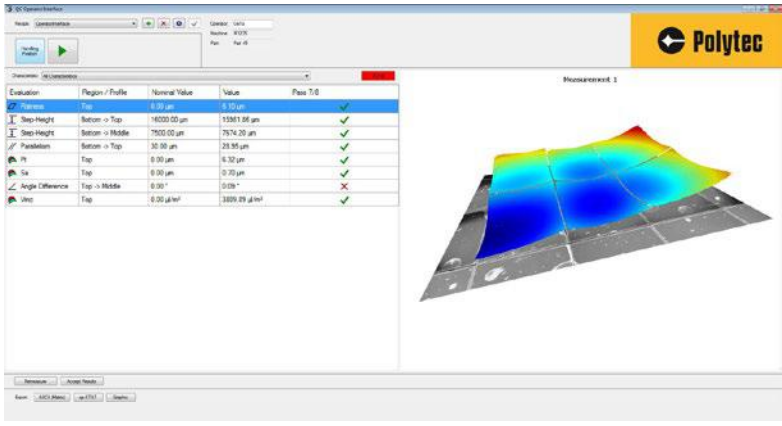
The QC Operator Interface manages application-specific recipes, making them available as one-click solutions perfect for operators with less expert know-how. This allows for fast and efficient pass-fail analysis, reduced operator mistakes and consistent QC procedures.



Polytec measurement recipes manage pre-defined acquisition and evaluation steps for surface quality control.

Managing different samples

Designed specifically to help with close-to-production quality inspections, where different samples are measured, the software module QC Operator Interface manages sample-specific measurement recipes. After having developed a recipe, you can upload it to the interface and the operator on the shop floor can use it to perform a measurement with a single click. Utilizing dropdown menus, all developed recipes are available to the operator. After performing the measurement with the selected recipe, the measurement results (numerical values, 2D/3D views, pass/fail overview...) will be shown briefly and can be easily exported. There are many ways to export measurement results, including .pdf and qs-STAT.



The QC Operator Interface allows fast and efficient pass-fail analysis by offering one-click solutions.

Loading the right settings

Use a bar code scanner for loading the correct predefined measurement recipe. This semi-automatic process saves time and avoids potential operator mistakes.

Integrated bar code scanner simplifies sample handling and recipe loading.

QC Operator Interface package for challenging manufacturing environment:

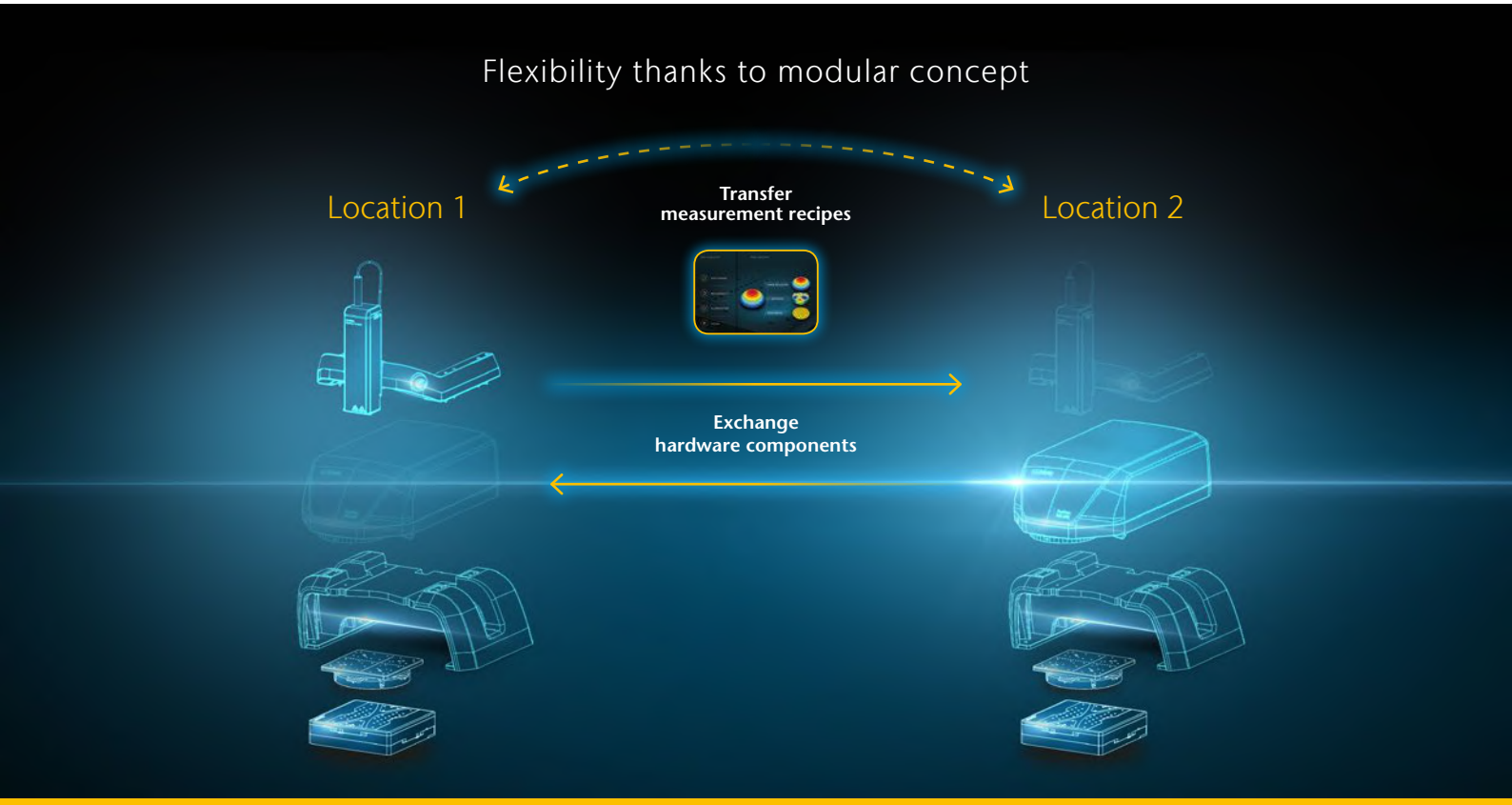
- **Handle different sample types** by using sample specific recipes
- **Increase your flexibility** with simple changes to measurement settings
- **Show traceable results** by monitoring the measurement settings
- **Decrease operator failures** by integrating bar code scanners
- **Make quick decisions** based on reliable pass-fail analysis
- **Share your knowledge** by using advanced reporting and export options

Assure quality and consistency. Globally.

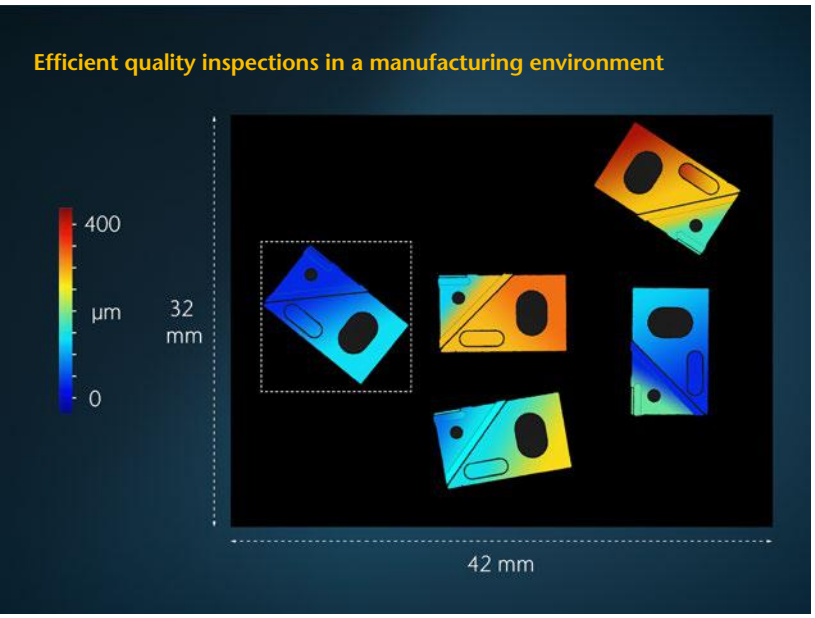
Adapt to increased production capacity

Short-term changes in the production schedule require substantial flexibility from manufacturing companies. For TopMap surface metrology systems, Polytec focuses on an interchangeable modular design. Main hardware modules of the measuring system (sensor head, stand, sample fixture, x-y stage or roughness module) can easily be switched or exchanged with parts of a similar Polytec system. The Software allows the transfer of data acquisition settings from one system to another. This modular design integrated with portable software allows the metrology system to scale with product line throughput requirements. In many cases where production capacity must be doubled or reduced, the hardware and all settings can be adopted to the needs.

As a long-term partner in industrial quality control, Polytec offers development, engineering and manufacturing of complete measuring solutions for full compatibility and future-proof investments. For instance, the open architecture of the Pro.Surf measuring system enables simple and straight forward upgrades in the field. Here, you can add the roughness measuring unit to installed Pro.Surf systems with ease, anytime.



The TopMap modular concept can react on short-term measurement tasks. Exchange main hardware components and transfer sample-specific measurement recipes for securing same quality throughout all locations.



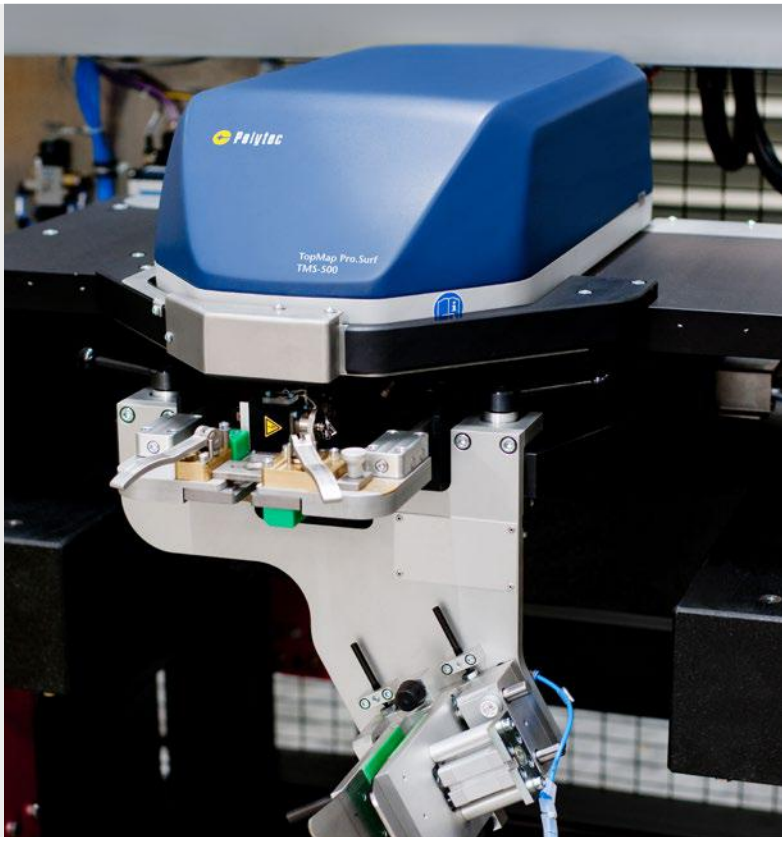
Automatic sample recognition (geometry and orientation) and the large field-of-view (FOV) allow quick and efficient multi-sample measurements without mechanical fixture.

!

Customization possibilities

Polytec is a strong partner in cases where standard systems must be tailored to your needs. For integrating the sensor head into a quality inspection cell or operating the QC process via the programmable logic controller, there is a custom solution with TopMap.

For feasibility studies, customization or further questions, contact us and benefit from the PolyXpert service and global support.



Sensor heads designed for machine integration: safe working distances and objective-free sensor design assure collision-free and smooth production processes.

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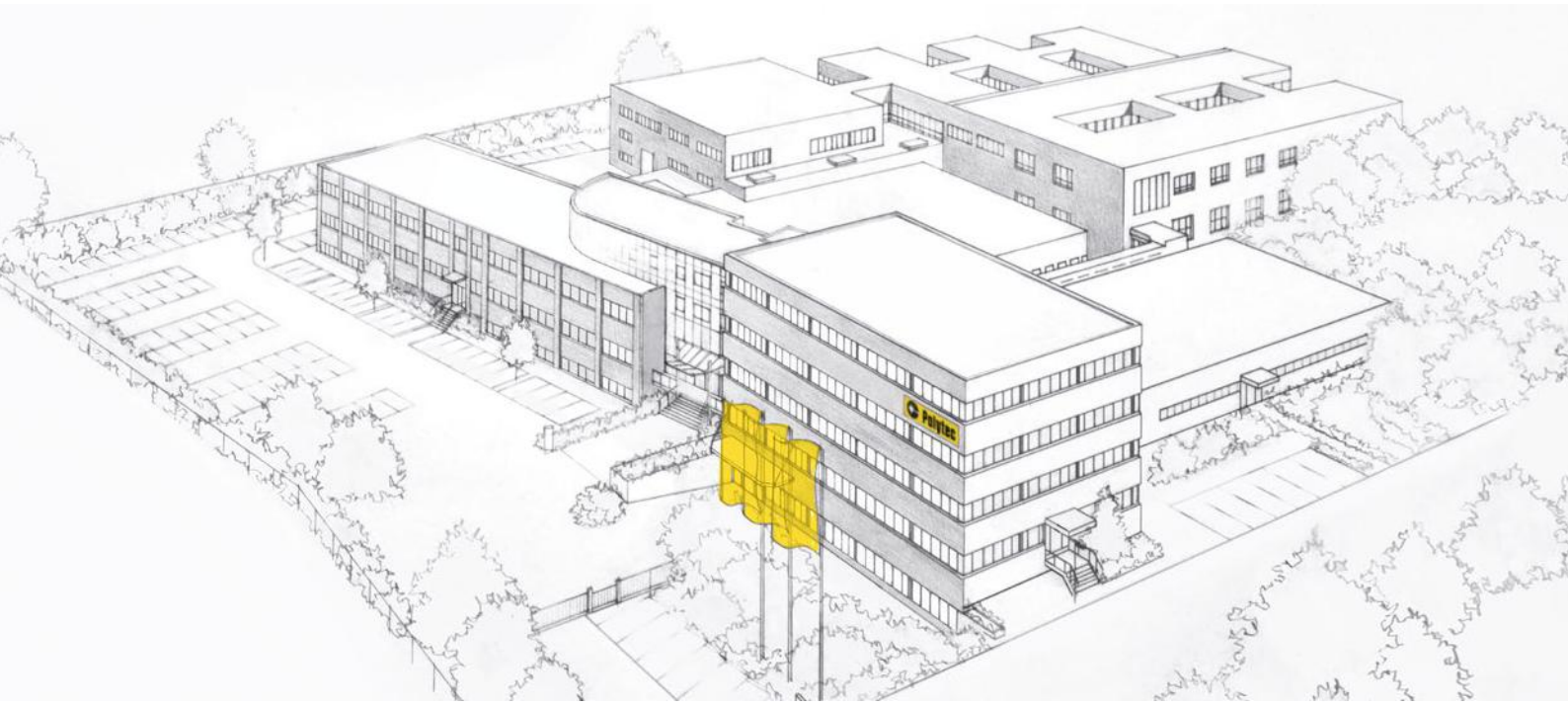

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