

## TopMap family



## TopMap family

Surface metrology in a new dimension

Product brochure





## Quality inspection of precision surfaces

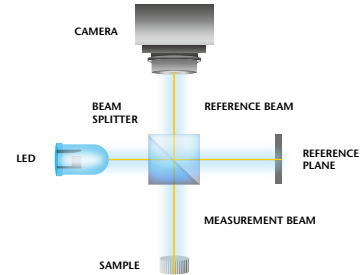
**In order to characterize precision-manufactured and other sophisticated surfaces, it needs measurement technology that is reliable, quick and application-oriented. Guaranteeing functionality and detecting defects at an early stage avoids unnecessary cost and increases the overall product quality and lifetime.**

Polytec addresses surface metrology applications with innovative, high-precision, non-contact optical technology that works on rough, smooth and stepped surfaces. White-light interferometers of the TopMap family are established quality inspection tools for the controls laboratory, in production environments or in-line.

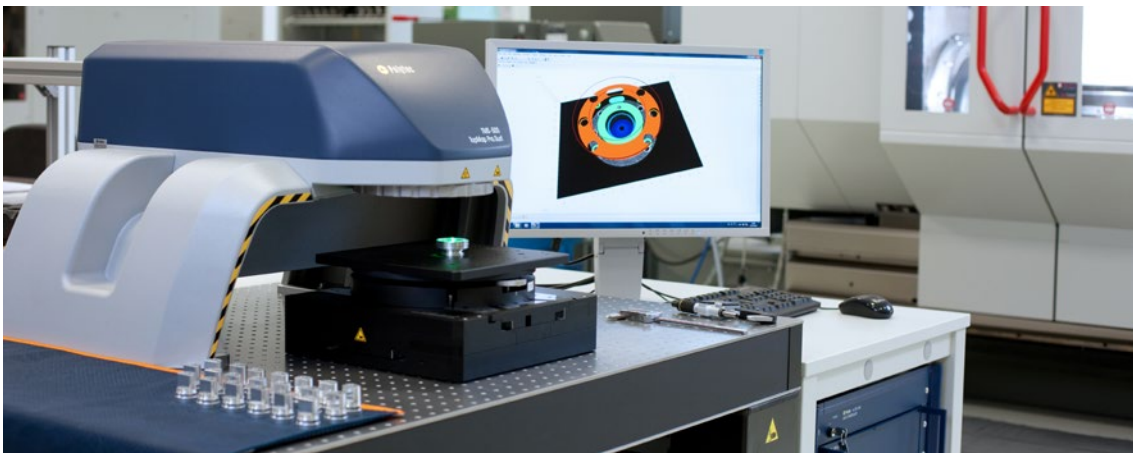


# Areal surface measurement with white-light interferometry

Structured functional surfaces with tight tolerances require high-precision measurement systems that can quickly scan the topography of a workpiece. Well-established white-light interferometry achieves a resolution at the nanometer scale.



*Principle of scanning white-light interferometry (Michelson setup)*



## Why optical measurement?



- Non-contact, non-destructive and repeatable
- Full areal information in 3D – don't overlook any details
- On almost any surface
- Excellent lateral resolution
- Check manufacturing tolerances in a short time

## Why TopMap white-light interferometry?



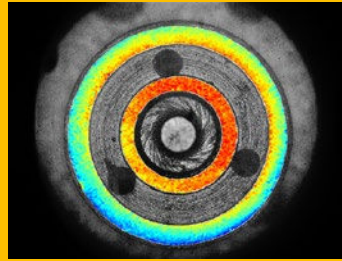
- Smart Surface Scanning Technology measures on almost any surface independent from reflectivity
- High precision and repeatability
- Easy to automate
- Excellent vertical resolution independent of objective magnification

# Versatile use

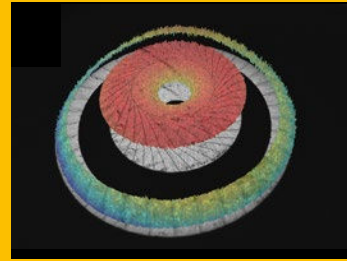
## A wide range of applications

Polytec's TopMap surface measurement systems are in their element in all operations where the finest components and structures need to be inspected. Non-contact white-light interferometry allows measurements with a resolution in the nanometer or even subnanometer range.

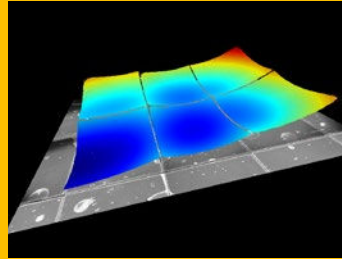
And it's for this very reason that Polytec's TopMap devices have become standard tools in the field of industrial quality control.



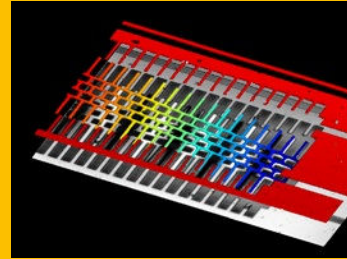
Sealing surfaces



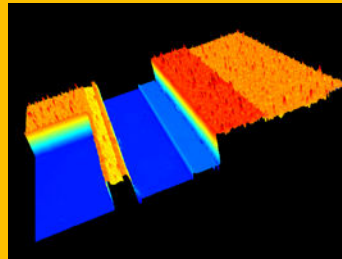
Form deviation



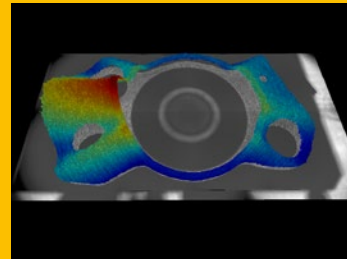
Warpage measurements



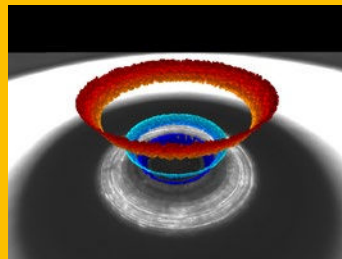
MEMS



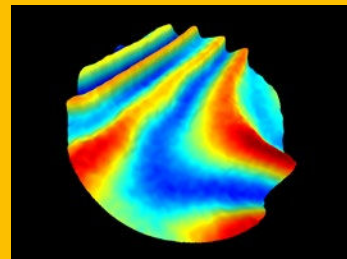
Wafer applications



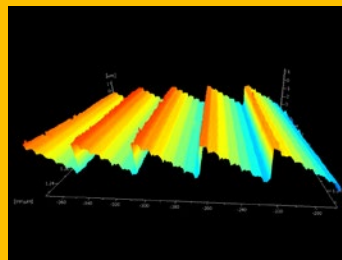
Pump barrel



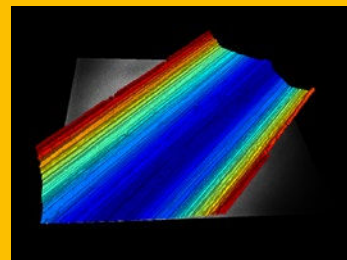
Cone measurement



Membrane measurement



Optical components



Tribology



Parallelism



Form parameter



Tribology



Roughness



Height & Steps

## Check manufacturing tolerances quickly

**... with high precision, high repeatability and based on traceable standards.**

With large vertical range and nanometer resolution, Polytec's TopMap systems are ideal for determining flatness, step-height and parallelism of large surfaces and structures, of a wide variety of materials.

# TopMap Metro.Lab Compact 3D workstation



The TopMap Metro.Lab from Polytec is a high-precision white-light interferometer (coherence scanning interferometer) with a large vertical measurement range. The TopMap Metro.Lab is ideally suited for non-contact measurement of flatness, step height and parallelism of large surfaces and structures even on soft or delicate materials.

## The entry-level of white-light interferometry

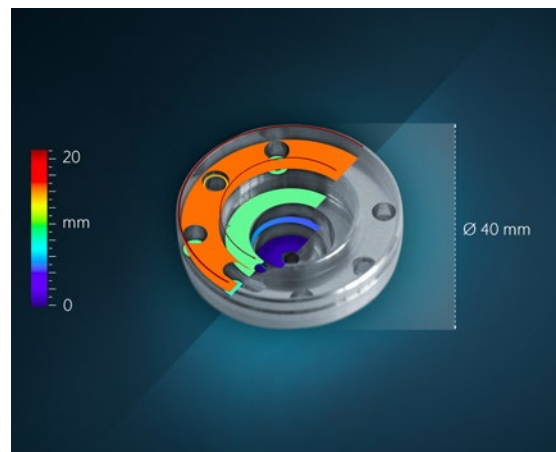
As a complete and compact 3D measurement workstation, the TopMap Metro.Lab allows the user to perform measurements with a large field-of-view and nanometer resolution.

Benefit from an open software architecture to program routine tasks or set up your very own user interface.

## Highlights



- Fast measurement of large areas measuring
- Reach deeply recessed surfaces like holes
- Easy-to-use and automated software with ISO compliant parameters
- Smart surface scanning technology measures on almost any surface independent from reflectivity



*Quickly measure large areas and visualize in 3D*

# TopMap In.Line

## For production integration

The TopMap In.Line is totally tailored to the needs of quality assurance in production, when cycle times are decisive and surfaces have to be measured precisely, without contact at a high speed.

### Fast characterization in the production line

The compact design of the TopMap In.Line means it can be elegantly and safely integrated into the production line. Since no objectives are needed, collisions and damage to the optics or component surfaces are avoided. The system measures form deviations, such as flatness or waviness, reliably and with short cycle times. It measures without contact the exact step height even in deep holes with steep edges from a safe working distance thanks to the telecentric optical design.

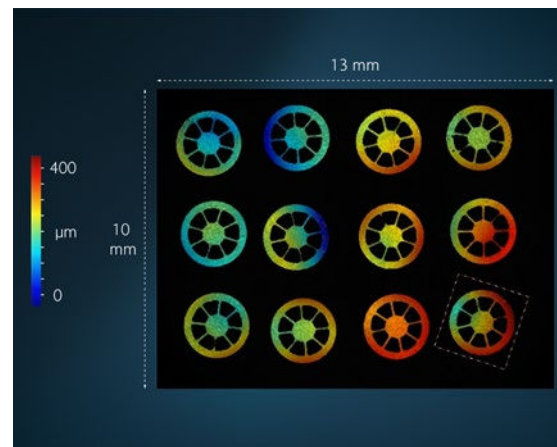
The freely programmable measurement and analysis software can easily be adapted to the needs of your production workflow. Measurement data is exported to your proprietary database and the integrated QS-STAT™ export enables you to reliably analyze process data.



### Highlights



- Fast non-contact measurement for short cycle times
- No risk of collision: easy integration in the production line with objective-free design
- Sensor head prepared for machine integration
- Integrated interface to customized databases and QS-STAT™



*Save time measuring multiple samples in a single shot thanks to a large field of view and automatic sample detection.*

# TopMap Micro.View®

## Table-top optical surface profiler



TopMap Micro.View® is an easy to use and compact optical profiler. Combine exceptional performance and affordability with this powerful metrology solution. An extended 100 mm Z measurement range with CST Continuous Scanning Technology allows complex topographies to be measured at nm resolution. This convenient table-top setup features integrated electronics, with the smart focus finder simplifying and speeding up the measurement procedure.

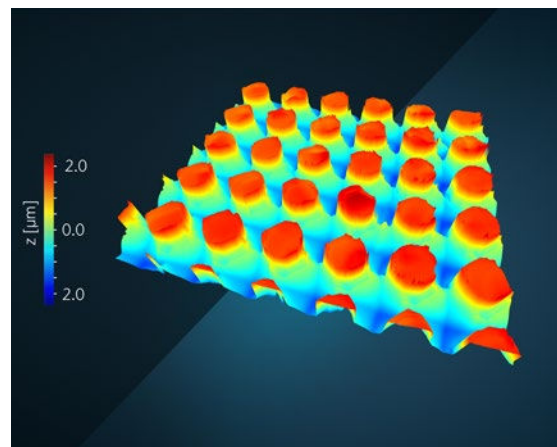
### Small footprint with expanded capability

Benefit from the optional ECT Environmental Compensation Technology, securing reliable and accurate measurement results even in noisy and challenging production environments. Micro.View® is the cost-effective quality control instrument for inspecting precision engineered surfaces in the field of manufacturing and research.

### Highlights



- Measure surface finish in a compact setup
- Non-contact measurement of 3D topography, roughness and texture
- 100 mm Z measurement range with CST Continuous Scanning Technology
- Excellent lateral resolution



*Quality inspection of surface details.*



# TopMap Micro.View<sup>®</sup>+

## Next generation optical surface profiler

TopMap Micro.View<sup>®</sup> is the next generation optical surface profiler. Designed for modularity, this comprehensive workstation allows for customized and application-specific configurations. The Micro.View<sup>®</sup> delivers the most detailed analysis of surface roughness, texture and microstructure topography. Combine 3D data with color information for amazing visualizations and extended analysis like detailed documentation of defects. The high-resolution 5 MP camera delivers incredibly detailed 3D data visualization of engineered surfaces.

### Automation enabled and production-ready

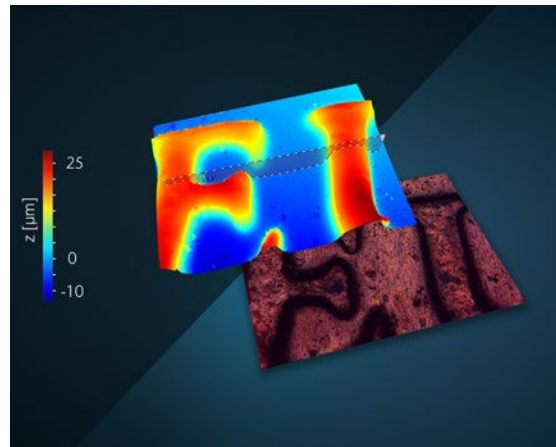
The encoded and motorized turret secures a seamless transition between objectives. Micro.View<sup>®</sup> also features the latest Focus Finder plus Focus Tracker, keeping the surface in focus at all circumstances. The fully motorized sample positioning stages allow for stitching and automation.



### Highlights



- High-end white-light interferometer with nm resolution
- 100 mm Z measurement range with CST Continuous Scanning Technology
- With Focus Finder and Focus Tracker ready for automation
- Motorized X, Y, Z, tip/tilt and turret save repositioning
- Color information mode for extended analysis and documentation of defects



*Detailed analysis with nm resolution and color information.*

# TopMap Pro.Surf

## The surface specialist

The TopMap Pro.Surf quickly, reliably and precisely determines form deviation. The TopMap Pro.Surf white-light interferometer is the ideal solution for non-contact surface topography measurement of precision-made surfaces – in the metrology lab, close to production or even right in the production line thanks to a robust design and a high level of repeatability.

### For reliable checking of precision-made surfaces

Its high vertical and lateral resolution, the telecentric optical design and the high measurement speed open up many applications. Two million measurement points are recorded on a large  $44 \times 33 \text{ mm}^2$  measuring surface in a matter of seconds without any need for stitching – and the surface area can even be extended to  $230 \times 220 \text{ mm}^2$ . With a 70 mm vertical measurement range and excellent vertical resolution, there is plenty of leeway for varying measuring tasks. The telecentric optics even measures in hard-to-reach areas, such as drill holes. Integrated machine vision tools speed up your quality control process. Detect several samples simultaneously without the need for a mechanical fixture.



### Highlights



- For large samples without stitching
- Large vertical scan range of 70 mm
- Telecentric optics measures even hard-to-reach areas like holes
- Automatic sample recognition avoids mechanical fixture



*Measure in hard-to-reach areas like holes with a special optical design and an astonishing 70 mm vertical scan range.*

# TopMap Pro.Surf+

## The all-in-one system

The TopMap Pro.Surf+ conveniently determines form both deviation and roughness in one single system – fast, reliable and precise. The upgrade of the high-end system TopMap Pro.Surf represents an all-in-one solution – thanks to the integrated roughness sensor.

### Combined measurement of form deviation plus roughness

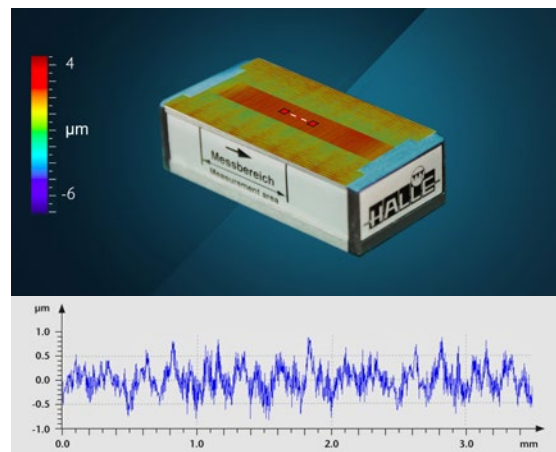
TopMap Pro.Surf+ offers a powerful multisensor solution to characterize surface topography by precisely determining both form parameters such as flatness, step height, parallelism and roughness parameters. Besides its intelligent multisensor concept the user will benefit from the high vertical and lateral resolution of the instrument, from its telecentric optical design and from the very fast measurement. Two million measurement points are recorded on a large 43 x 32 mm<sup>2</sup> measuring surface in a matter of seconds without the need for stitching – and the surface area can even be extended to 230 x 220 mm<sup>2</sup>. Integrated machine vision tools speed up your quality control process. Detect several samples with a single measurement without the need for mechanical fixtures.



### Highlights



- Quick and precise 3D surface characterization plus roughness measurement
- All-in-one system detects all surface details
- Safe sample handling thanks to a long working distance







*Measure both form parameters of large samples and roughness with just one system.*

# Polytec TMS Software as complete solution

The powerful TMS Software (Topography Measurement System) offers an array of options as one-stop solution for surface analysis. The latest generation software suite acquires precision data and allows for a range of post-processing to highlight the parameter of interest. A few mouse clicks is all it takes to automatically run a measurement with pre-defined settings.

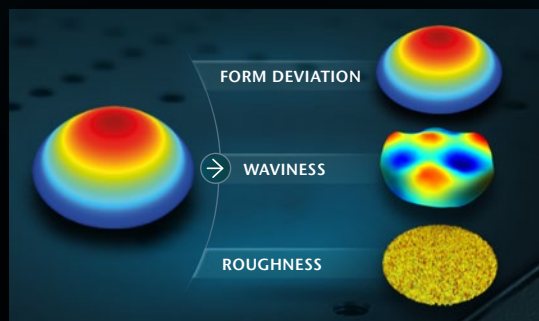
Now compatible with a barcode scanner, the complete measurement sequence can be automated with minimal user input.

## Data acquisition

-  **POSITIONING**
-  **MEASUREMENT**
-  **ILLUMINATION**
-  **SIGNAL**

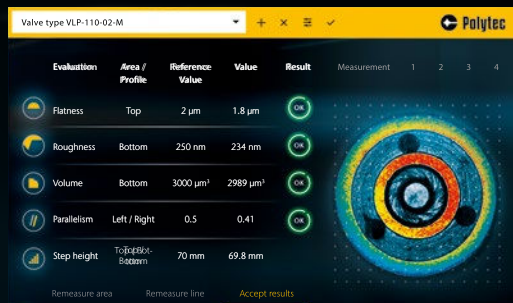
Setup the data acquisition in detail for repeatable measurement and traceable results. Generate, save and load acquisition settings with ease.

## Data evaluation



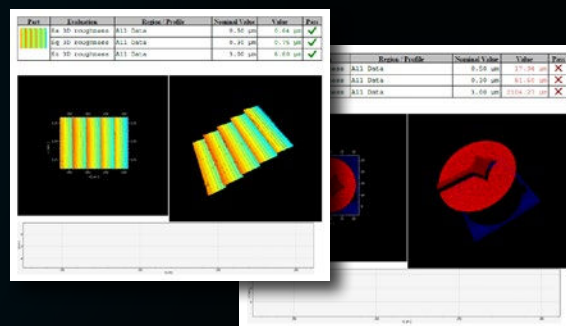
Analyse 3D surface data with extensive set of surface parameters (including ISO 25178) and thanks to direct access to acquisition settings use them as further decision criteria for your analysis.

Easy customization and integration, fully developed and supported in-house



Pre-defined measurement recipes help reduce complexity with an intuitive user interface. The QC Operator Interface is ideal for deal for routine and repetitive inspections.

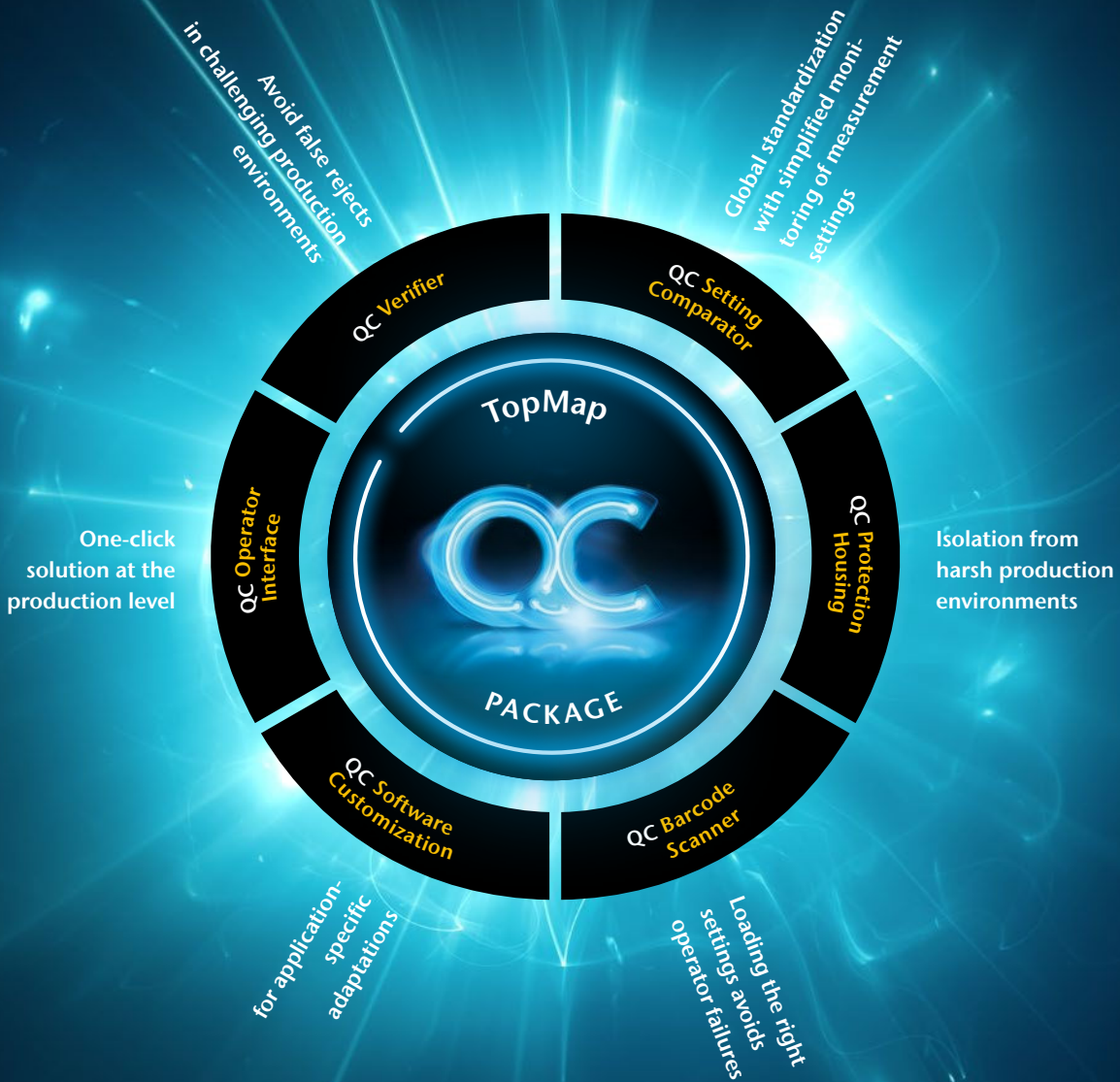
## Automation



Generate and update reports concurrently with a simple set-up in the all-in-one TMS software. Ensure traceability by also recording evaluation steps.

## Reporting

# TopMap surface metrology – quality control (QC) in production



Industrial production benefits from tightly integrating surface 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, assure to stay within production tolerances and improve your process capability.**

# Tailored to your needs

Besides optical measurement instruments, Polytec offers a number of software options, application-oriented accessories and customizing options making it your very own TopMap system tailored to your needs.



## Software

The smart software helps to speed up your quality control process, saving and loading routine measurement programs and providing individual configurations for each user and application, where it is necessary. Thanks to automated sample detection and a large field of view, you measure multiple samples simultaneously without the need of mechanical fixture.



## Customizing solutions

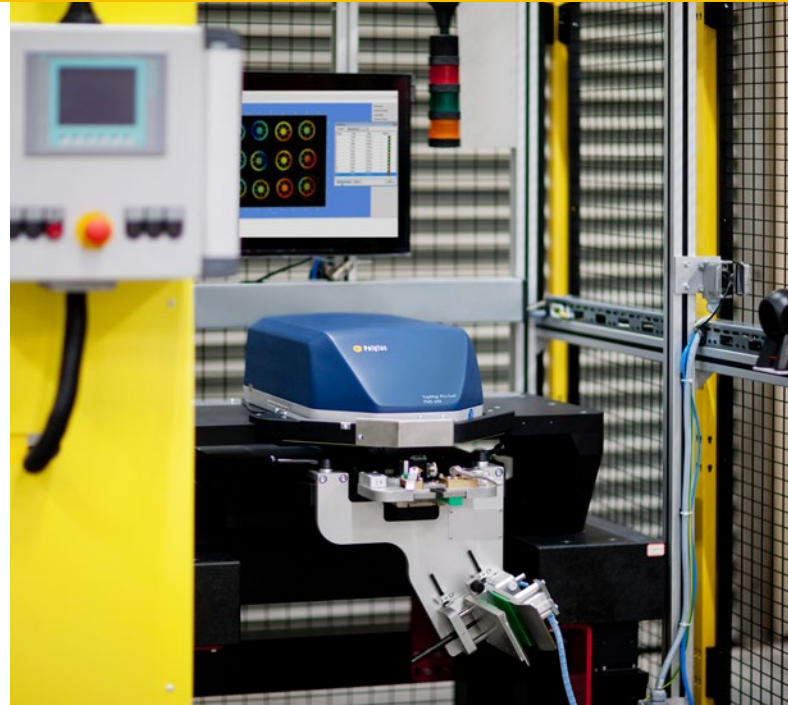
Polytec not only offers turn-key solutions but also individually customized hardware and software solutions based on your specific needs. For example optional glass compensation to measure through transparent materials.



## Measurement service and on-site support

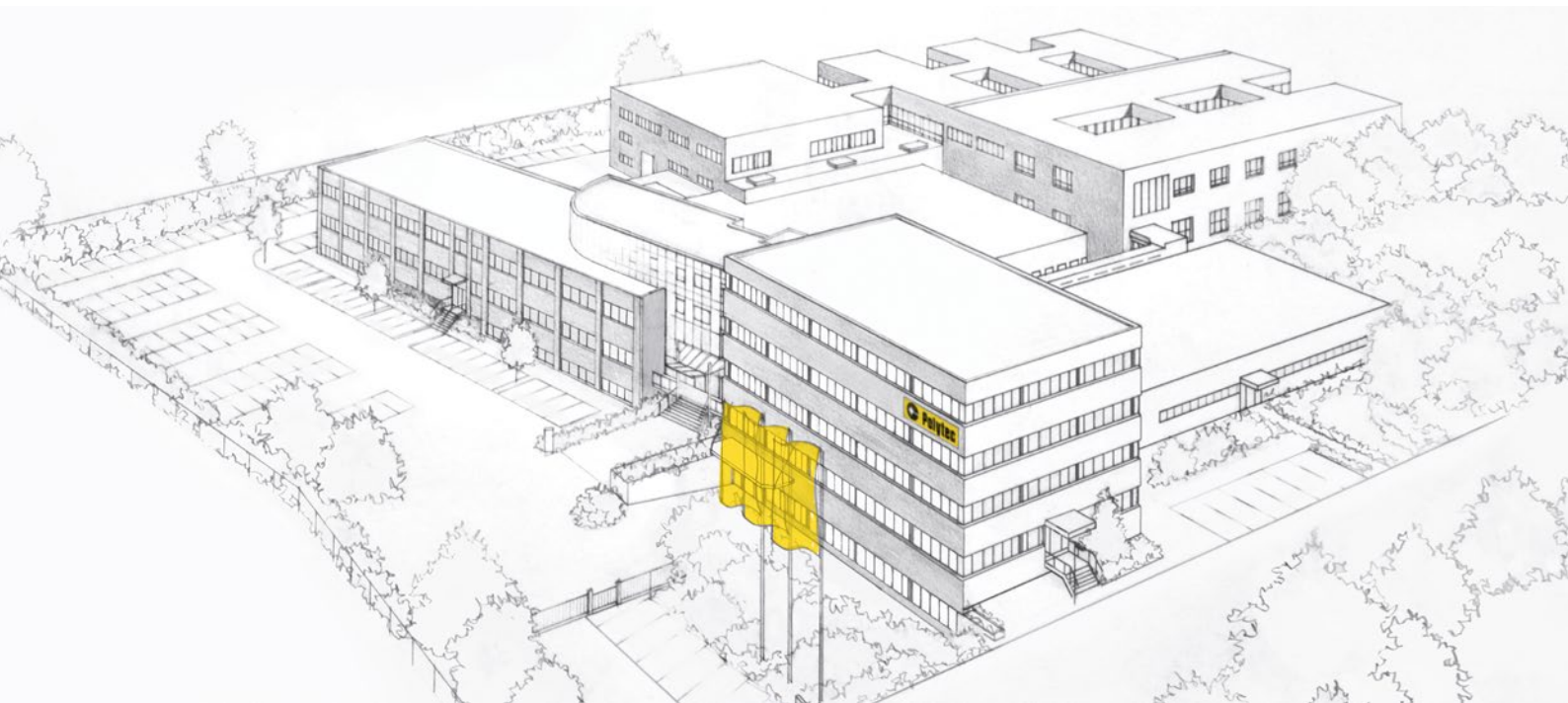
Our PolyXperts are pleased to help you with your individual measurement tasks – we support you with feasibility studies, training, measurements to order – or directly on your site. Our preventive maintenance program offers you a maximum of reliability and safety.

**More information: [www.polyxpert-services.com](http://www.polyxpert-services.com)**



*Customized solutions for in-line measurement (with integrated bar code scanner and automated sample detection)*





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